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Two Cases of Uterine Fibroid in which Degeneration in the Tumour—Perithelioma and Necrobiosis—caused difficulty in diagnosis.*

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Two years ago Professor Watson and I recorded a case of perithelioma of the uterus producing a tumour about the size of a five months' pregnancy.[1] The cervical canal admitted the finger, and through it the pole of the tumour could be felt projecting free into the dilated cavity. On section the tumour was yellowish-white, resembling brain tissue in appearance and consistence, and showed many hæmorrhages. It resembled an ordinary sarcoma.

The first tumour described in this communication was the size of a seven months' pregnancy (Fig. 1). It consists of one large cavity, containing more than two pints of blood-stained serous fluid. The walls of this large blood-cyst show the structure of a uterine fibroid; the cavity is lined in parts with soft, yellowish-white breaking-down tissue showing the changes of perithelioma (Fig. 2). The uterine cavity extends round one-third of the tumour, having a relation to it similar to what is found in a large interstitial fibroid.

The history of the case is as follows:—M.D., aged 62, single. Seven years previously I removed a large sloughing fibrous polypus which protruded from the vaginal orifice and had such a thick pedicle that it was considered advisable to ligature it in three parts. After its removal the patient made a slow but satisfactory recovery, remaining in the ward for two months. On her discharge the uterus was still large, but there was no indication for hysterectomy. For the following five years she was perfectly well; about two years ago she began to feel weak and easily tired, but had no pain. She

* Read at the Edinburgh Obstetrical Society, March 1913.

1. *Journal of Obstetrics and Gynæcology*, vol. xx, p. 116.

noticed a swelling of the abdomen, which gradually increased, but she was not prevented from doing her usual housework.

On admission on this occasion, the abdomen was distended by a large tumour about the size of a seven months' pregnancy, having a peculiarly tense consistence, suggesting that it is in parts at least cystic. It has a uniform surface, and its form and the relation of the cervix suggest that the tumour may be the distended uterus. Had it not been for the previous history it would have been difficult to hazard a diagnosis, but the fact that a fibroid had been removed before suggested that it was a fibroid undergoing some pathological change, or causing obstruction leading to accumulation of pus or blood in the uterine cavity.

On abdominal section the pale, bluish-white appearance of the cystic tumour suggested that it might be ovarian, but on passing the hand round to determine its attachment it was found to be a uterine tumour, which was removed by supra-vaginal hysterectomy.

For the following description of the tumour I am indebted to Dr. Cairns, of the University Gynæcological Laboratory.

The tumour is ovoid in shape, reaching in its greatest length 23 cm., and in its greatest breadth 14 cm. Incorporated in its substance is the uterus, whilst from its lower pole projects the cervix. It is of a bluish colour, soft in consistence, suggesting fluid contents. Remains of adhesions to neighbouring organs are to be found on its walls.

The tumour was hardened, and when opened later was seen to consist of a large cystic cavity, over the anterior wall of which was stretched the uterine cavity with its walls correspondingly thinned out. The cyst contained two pints of dark-coloured fluid which subsequent examination proved to be blood-stained serous fluid. The uterine cavity reached almost to the highest point of the cyst wall, and its length was 19 cm. The cyst presents about the middle of its posterior wall the remains of a septum running horizontally for a distance of 6 cm. The wall of the cyst is comparatively thin, and, with the exception of that part which constitutes the posterior wall of the uterus, is lined by a layer of soft caseous material present in a thickness of varying degree. In the postero-inferior quadrant of the wall this material is present in its greatest quantity, and there it constitutes a definite palpable tumour projecting into the cyst cavity and surrounded at its base by a wide area of small, soft, nodular elevations of apparently the same consistence. Superiorly this growth is limited by the septum, but beyond this there is a second elevation of similar characters but of less extent projecting also into the cyst cavity. The cyst wall is particularly thin at this point and extension is evidently also taking place in an outward direction. From this point to the fundus the caseous matter diminishes in quantity, though still persisting in an amount sufficient to constitute an appreciable

Fig. 1. Uterine fibroid with large cavity containing blood-stained serum and showing peritheliomatous degeneration of its wall.

Fig. 2. Section of tissue from A in Fig. 1, showing peritheliomatous degeneration.

lining for the cyst wall. Anteriorly the wall of the cyst is smooth and regular except for the presence here and there of calcareous patches which in one or two places are raised up into the form of papillæ.

Microscopic sections of the tissue lining the cyst wall from points A to B, Fig. 1, show it to consist of a peritheliomatous new growth. The tumour in its most typical form is easily recognizable at point A, where also it appears to be of most recent origin. Fig. 2 is a micro-photograph of the tissue from the point A in Fig. 1. It shows several small vessels lying in a loose cellular stroma, whilst from the walls of the vessels there is definite cellular proliferation extending in the form of columns out into the stroma. Sections from other parts of the tumour between A and B show similar microscopic appearances, differing only in that the further from A the section is taken the more general is the change and the greater the proportion of perivascular overgrowth to the stroma.

The second tumour described is one of necrobiosis of a large uterine fibroid causing death of the patient.

The history of this patient was as follows:—M.D., aged 51, married, was brought to Ward 35 by Dr. Edwards, Bridge of Earn, complaining of an abdominal swelling which she had noticed for some months (the patient was too ill for the exact history to be obtained), but which during the past few days had increased in size, with such acute pain that she had to be kept under the influence of morphia. There is no definite note as to her menstruation, which had been absent for some months. This gave colour to the possibility of hydramnios, though the age of the patient made it extremely improbable. On admission, she was in a state of extreme collapse. The temperature was 98°, pulse 120, respirations 22. The abdomen was distended with a tumour about the size of a seven or eight months' pregnancy, showing an even rounded contour dropping rather suddenly above the umbilicus. The skin showed numerous old striæ. On palpation an elastic tumour was felt rising out of the pelvis, with a smooth surface, and while it gave no fluctuation or thrill its tense character resembled hydramnios. No souffle on auscultation. On vaginal examination a multiparous cervix was found on the lower end of the tumour, the body of the uterus not being made out separate from it. On account of the acute symptoms I decided to operate at once.

On abdominal incision a dark-coloured tumour covered with peritoneum was found, apparently a large fibroid undergoing degeneration. It was removed in the usual way by supra-vaginal hysterectomy. There was no fluid in the peritoneal cavity and no peritonitic adhesions. After operation the patient vomited a great deal, and this symptom continued till her death on the sixth day, in spite of washing out the stomach.

After the operation the temperature fell from 100° to 97°, the pulse was 120, and respiration 30. The patient was put on strychnine, one-fiftieth of a grain four-hourly hypodermically.

The following day the temperature varied from 97° to 99°, the pulse from 132 to 152, and respirations from 36 to 42. The patient passed flatus and was put on a rectal saline. On the third day the temperature varied from 96·5° to 97·8°, pulse from 134 to 150, and respirations from 38 to 42. The patient was still vomiting frequently, and restless. On the fourth day the temperature varied from 96° to 98°, pulse from 120 to 168, and respirations from 38 to 44. The stomach was washed out. On the fifth day the patient became much weaker. The temperature varied from 96·2° to 98°, pulse from 100 to 120, and respirations from 36 to 52. On the sixth day the temperature varied from 96·2° to 97°, pulse from 86 to 102, and respirations from 38 to 48. The patient died on the following morning from sudden failure of the heart.

In Dr. Harvey's report of the post mortem the following points are noteworthy:—"The heart muscle is pale, showing fatty infiltration, especially towards the apex; the right lung showed considerable degree of emphysema, congestion and œdema of the lower lobe, with two patches of broncho-pneumonia; the bronchi contained yellowish-brown material. The left lung was also emphysematous, deeply congested and œdematous, patches of broncho-pneumonia with early consolidation scattered through the lobes. The contents of the bronchi were markedly blood-stained. The stomach was greatly dilated, with a few small hæmorrhages on the mucosa. The liver shows cloudy swelling and slight fatty changes. The ileum shows more or less acute congestion throughout. The kidneys were pale, with cloudy swelling and fatty change."

The immediate cause of death as shown by post mortem was therefore broncho-pneumonia. On making a section of the fibroid immediately after operation, the tense character of the tumour was seen to be due to its œdematous condition. On section the tumour was of a purplish colour with brighter red areas, and as soon as the capsule was divided with the knife the more solid portions of the tumour were extruded from the softer parts.

The interesting features in this case are the acute symptoms which developed as the result of necrobiotic change affecting a tumour of this size. The clinical condition of the patient, grave in the extreme, as shown especially in the collapse and state of the pulse, was due to the changes in the substance of the tumour, as there was no indication of peritonitis. The broncho-pneumonia was part of a septic condition secondary to the necrobiosis. The special interest of the case was the difficulty in diagnosis arising from the rapid development of the symptoms and the tense elastic consistence

of the uterine tumour which presented the same physical features as the first case.

Among the many points of interest in these cases there are two which are worthy of special comment: (1) the significance of changes arising in fibroid tumours which mean malignancy or lead to the death of the patient; and (2) the difficulties in diagnosis to which degenerative changes may give rise.

With regard to the first of these, sarcomatous degeneration is recognized as a possible change in fibroids, and several cases of perithelioma have been described. I note that Dr. Leith in his discussion on the pathology of malignant tumours of the uterus, which forms the subject of the Ingleby Lectures for 1910, includes perithelioma under the head of "sarcomatous degeneration." With regard to the frequency of sarcomatous degeneration he states: "When due allowance is made for doubtful cases it is probable that the proportion of fibroids coming to operation in which a sarcomatous change has occurred is not far from 2 per cent. of the whole." He includes under it the following types: "The first constitutes that form of sarcoma known as an *endothelioma*, the second a new type unknown in other situations, and the third that form known as *perithelioma*, in which the sarcomatous cells spring from the endothelium lining the lymph spaces of the outer coat. It is theoretically possible that the embryonic fibroblasts of the outer coat may, like those of the general substance of the growth, revert and constitute an ordinary round, spindle or irregular-celled sarcoma, called, because of its position within the fibroid, a *myoma sarcomatodes*. The new type of sarcoma springing from the myoblasts of the middle coat of the vessels or from other myoblasts throughout the growth is conveniently spoken of as a *myosarcoma*. The name *mesothelioma*, which is naturally suggested by those of *endothelioma* and *perithelioma*, is not available for this variety, as it has already been appropriated for the malignant growth springing from the endothelium of serous membrane, *e.g.*, the pleura, peritoneum, etc. We thus have a variety of sarcomatous growths arising within fibroids, the *endothelioma*, the *perithelioma*, the *myosarcoma*, and the *myoma sarcomatodes*, which may be the explanation of the relatively low degree of malignancy exhibited by most of these growths. Those originating in fibro-blasts, though varying greatly in malignancy, show it in greatest degree, whilst the myosarcoma is the least malignant of all, the other two forms showing varying intermediate degrees."

As regards peritheliomatous degeneration of a fibroid, Doran and Lockyer record an interesting case in the *Journal of Obstetrics and Gynæcology* for November 1908, in which there was a large, pale, cystic uterine growth which had burrowed deeply into the broad

ligament on the left side. During its enucleation from the iliac fossa about one pint of pale yellow fluid escaped from the cystic cavity in the interior. Sections of the uterine wall, Fallopian tube, ovary and tumour showed that these organs and tissues were all invaded by perithelioma.

Necrobiosis is not often followed by a fatal result. I have removed several small fibroids showing this change but without any marked symptoms beyond a tenderness over the tumour, and sometimes slight rise of temperature.

As to the cause of general infection of the system which was so marked in this case, Leith says in the Ingleby Lecture that poisons allied to the amines have been found, and they, along with the tendency to bacterial infection, may account for toxæmia or sapræmia, which may become pronounced in the cases.

In a recent paper on the red degeneration of uterine fibromyomata,[1] Professor Lorrain Smith divides cases of red degeneration into two classes—the thrombotic and angeiomatous. The thrombotic form shows the clinical symptoms present in this case, and the changes in the tumour are accounted for by the retardation of the circulation which produces a large quantity of fat. The red colour of the tumour is due to the hæmoglobin staining associated with the action of the accumulated lipoids.

The second point is the difficulty in diagnosis which the change in the character of the tumour produced in both cases. Fibroids are marked by slow growth and solid consistence. When they become cystic both these characteristics are lost. Cases of a single large cyst are not uncommon, but not of the size present in the first tumour.

Leith figures two cases of cystic fibroid, one in which a smooth-lined cavity on the lower end of the tumour contained about 1½ pints of clear yellow fluid. No epithelial lining could be demonstrated but it was probably lymphangiectatic. The tumour extended to four inches above the umbilicus.

In the second case the whole tumour had almost completely broken down into a brownish-yellow waxy-looking substance and was filled with dark chocolate-coloured thick fluid. This patient was aged 52.

The late Dr. Wallace, of Liverpool, who saw this case in my ward before operation, told me of a patient, aged 67, on whom he operated for what was thought at first to be an enormous hæmatometra. Examination of the tumour showed that the blood collection was everywhere bounded by true myomatous tissue and that the uterine cavity had become completely obliterated.

1. *Journal of Obstetrics and Gynæcology of the British Empire*, March 1913.

In both of my own cases the whole tumour was involved in the cystic or necrotic change, so that instead of there being firmer and softer or more cystic portions the form and consistence of the tumour resembled a case of hydramnios. Had the condition developed during the child-bearing period this is the first thing one would have thought of in connection with the character of the tumour on abdominal palpation. In the first case the tumour, even after it was taken out, resembled a uterus distended with fluid, only that it was pale-white instead of red owing to the amount of distension. In the second case the tumour had the appearance of a fibroid uterus, only it had a tense elastic feeling instead of being firm and solid. The ages of the patients, 62 and 51, bear out what is now a common experience, that uterine fibroids often give rise to trouble late in life.

Four Cases of Inversion of the Uterus.[1]

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Four cases of inversion of the uterus personally seen have exemplified both of the varieties of this condition—the post partum or puerperal and the pathological or non-puerperal. Two were of the former class, one being acute as it occurred immediately after the birth of a child, while the other was chronic, having manifested itself several weeks after parturition. The pathological or non-puerperal cases owed their origin to the presence, in both instances, of a tumour attached to the inner surface of the uterus at the fundal extremity, and, very strangely, these tumours were not of the fibroid character usually found, but were carcinomatous.

Very many cases of acute puerperal inversion having been recorded, the history of mine need be narrated very briefly as it is similar to that of many others. It occurred in the practice of a friend, who one afternoon telephoned me to come quickly to a patient. She had been delivered normally of her first child, and soon afterwards had suddenly become seriously collapsed and was in a critical condition. In about fifteen minutes I was with her, but she was only too evidently sinking and beyond help. The uterus was in a state of inversion, as could be seen at a glance, but no more than the examination was possible as death occurred a very few minutes after my arrival in the house, and in less than an hour after the birth. It was tragically distressing as the patient was a healthy primipara of 24. The labour, although somewhat tedious, had been normal, and forceps had not been used. While the expulsion of the placenta was being aided by what was emphatically declared to be moderate supra-pubic pressure, excruciating pain and collapse suddenly set in along with an increase in the amount of hæmorrhage. This last symptom was of course due to the placenta not being completely detached.

This acute variety of puerperal inversion of the uterus is, fortunately, of comparatively rare occurrence, although it is impossible to form an approximately correct estimate of its frequency, various statistical tables exhibiting such marked discrepancies. The text-books of obstetrics, even to the most recent, invariably quote the older figures and inevitably inform us that Denham, in 100,000 cases of

1. Read at a Meeting of the Edinburgh, Glasgow, and Midland Obstetrical and Gynæcological Societies, held in Manchester, on May 30, 1913.

labour in the Rotunda Hospital, found one inversion recorded, and that Carl Braun in Vienna, from 1849 to 1878, reported not a single case in a quarter of a million births. Not readily can such statements be reconciled with that of Kehrer, who has declared that the accident occurs as often as once in 2,000 labours. Jardine discovered no more than three cases in 51,920 births in the Glasgow Maternity Hospital, and yet inquiries which I have made among many practitioners doing obstetrical work incline me to believe that the accident is of more frequent occurrence than either published reports of cases or hospital records would lead us to believe. W. Thorn, of Magdeburg, collected 437 cases recorded in medical journals from 1888 to 1910—22 years. They almost certainly must occur less frequently in hospital than in private practice. That is indisputable, and it must also be remembered that on the whole the general practitioner is not much addicted to the publication of his cases.

Though opinions may thus differ with regard to the frequency of acute inversion, there can be no controversy as to its seriousness. It is indeed one of the gravest complications of parturition, many cases resulting fatally, generally within a half to one hour after the occurrence of the accident. Crosse collected 109 cases, in which 80 patients died a few hours after delivery—a frightful mortality. It must be remembered, however, that Crosse's papers were published so far back as 1844 and 1847 respectively. Winckel gave 54 cases, with 12 deaths, and Phillips 184, with 43 deaths. Probably the mortality rate nowadays averages 25 per cent.

Hæmorrhage alone is not usually the cause of death: shock is generally exceedingly profound in fatal cases. In mine it seemed to be almost the sole cause as the patient had screamed out on account of the uterine pain experienced at the moment of inversion and immediately after was in a condition in which all the well-known signs and symptoms of shock and collapse were present.

In relation to acute inversion many other subjects, in addition to its frequency and its symptoms, well worth discussion occur to one's mind, but the only point which I wish to raise now is with regard to treatment. Later consideration of the case which I had seen convinced me that the imperative need in the presence of such a serious condition is at once to control hæmorrhage,—this can be rapidly done by completely stripping the placenta off the uterine wall and applying pressure,—and simultaneously to combat the shock by saline infusions, stimulants, heat, and like measures. It was therefore with complete sympathy and agreement that I read the paper written by Mr. Miles Phillips, Sheffield, a few months ago, in which he expressed opinions similar to those I had already formed and at which he had arrived after an experience of three cases. He quotes with disapproval teaching such as that given in Herman's "Difficult Labour," that "however exhausted the patient

may be, and however unfit she may seem to undergo an attempt at replacement,. . . . there is only one thing that will benefit her, ... therefore do not waste time in trying to revive the patient's strength, but replace the uterus at once." This is practically the teaching universally expounded, but, while admitting that, if shock does not exist or only slightly, it may be good practice to reduce the displacement at once, it is yet my conviction that it is dangerous, if severe shock is present, to waste time in this not always easy task, and it cannot be denied that the high mortality rate which has prevailed under the influence of current teaching invites the reflection and provokes the observation that a successful restoration of an inverted uterus which is attended, or immediately followed, by the death of the patient cannot be complacently regarded as an obstetric triumph.

Whatever may be the cause of the shock, it is undoubtedly produced at the moment of inversion, and, naturally, it tends, if not severe enough to kill the patient almost at once, and if not attended by excessive hæmorrhage, to pass off in time. Mr. Phillips has shown that the process of re-inversion also causes shock and may kill the collapsed patient. He says: " Indeed, there can be no doubt that this has frequently happened. A study of a long list of recorded cases would appear to prove the point."

In the energetic treatment of shock we have, nowadays, a most valuable addition to our armamentarium in pituitary extract, and it should be employed in conjunction with the other measures mentioned. When a rally in the powers has occurred and before the parts have undergone much change an anæsthetic may be administered,—it is safer at this than at an earlier stage,—and the uterus restored to its normal position.

The second case, that of chronic puerperal inversion, presented several features of interest.

The patient was 23 years of age, and had been attended by a midwife. Like the last patient, she was a primipara, and it may be noted, parenthetically, that Beckmann and Vogel have shown that the puerperal form of inversion is commonest in primiparæ and those under 30. It is not easy to suggest a satisfactory reason. The labour was normal and non-instrumental, the child being born naturally, after about twelve hours' labour. Fifteen minutes afterwards the placenta was delivered without, according to the patient, any traction on the cord or undue manual pressure over the abdomen. Hæmorrhage seemed more abundant than usual, but no alarm was felt and no skilled medical help was obtained. There was no pain, no symptoms of shock, and when the patient rose in a fortnight the discharge had ceased. At the end of other five weeks, however, it returned and continued for about two weeks. After ceasing for a week it again appeared, and in this manner it went, off and on, until the woman felt compelled to consult a medical practitioner,

who, neglecting to make a vaginal examination, naturally failed to make a diagnosis. No improvement resulting from the drugs prescribed and taken, the patient ultimately was admitted into my hospital wards, four months after the birth of her child. Anæmic and tired-looking, she complained of the irregular bleedings but not of pain. The diagnosis was fairly easy. The inversion was complete. Under anæsthesia attempts at reduction by all the known methods of manual taxis failed, though it must be said that excessive or prolonged force was not employed, both because of the smart bleeding which was set up from the congested endometrium by the manipulations, and because of my fear lest either a finger or fingers should be poked through the uterine wall or the cervix be torn. The former of these accidents I had already witnessed in another case, and as to the second it seemed evident that the rigid neck of the inverted peritoneal sac must be much smaller than the body of the uterus which has passed through it. Force excessive enough to be dangerous appeared therefore, to my mind, unjustifiable, even if replacement were successful, and after our moderate but firm taxis had failed, the vagina was again packed as thoroughly as possible and the patient was returned to the ward. Further consideration of means of treatment determined me not to try any form of repositor. Except in text-book illustrations repositors are unknown to me, and successful as they have often undoubtedly proved, they must surely be described as untrustworthy, dangerous, and opposed to our modern ideas of clean surgery. Vaginal amputation of the uterus, although recommended in obstinate cases, seemed too drastic treatment in the case of so young a woman, and the various operations of vaginal hysterotomy associated with the names of Cooke, Spinelli, Küstner, Kehrer and others were negatived by personal dislike of working in the dark and performing so many manipulations in such a cramped space. Perhaps here it may be well briefly to recall to our memories Küstner's operation as modified by Piccoli,—the best of its class. A transverse incision is made into the pouch of Douglas, the finger is introduced into the inverted funnel of the uterus and any adhesions found are separated. A longitudinal incision is then made through the posterior uterine wall in the middle line, beginning about an inch below the inverted fundus and ending about the same distance above the external os. The uterus is reinverted by fixing the funnel with the index finger in Douglas's pouch and the fundus is pressed in with the thumb of the same hand. The uterine incision is stitched by deep and superficial sutures, and, finally, the pouch of Douglas is closed with sutures. Discarding this operation, however, for the reasons already given, I opened the abdomen by the usual median incision, and from above had a clear view of the condition. Tubes, ovaries and ligaments were dragged into the funnel, but no adhesions had formed. An attempt to effect reduction by dilating

the neck with the fingers while an assistant pressed on the uterus from the vagina, was soon discontinued as dangerous and futile. I therefore without hesitation passed a knife inside the funnel or cup almost to its lowest point and split up the posterior uterine wall and upper part of the cervix. With great ease and in a minute or two the reduction was made, pressure from the vagina materially helping. Bleeding was not profuse. Deep and superficial catgut stitches united the muscular and peritoneal surfaces and the abdomen was closed. The whole operation occupied not more than fifteen minutes, there was no shock, and the patient went home later, looking and feeling well, her uterus normal in size and position. Recovery was not altogether afebrile, but this was scarcely to be expected as the uterus had been inverted for several weeks at least and had latterly been subjected to handling with inevitable bruising of the tissues.

The course of such a case as this must be a matter of conjecture, but probably there is originally only dimpling of the fundus as the result of the absence, complete or partial, of normal uterine contraction and retraction. Symptoms of shock do not occur; the only unusual feature is the exaggerated post partum hæmorrhage.

The necessity for prophylactic treatment, so far as we know it, need not be urged at his time. It is self evident. We may require, however, to be reminded that if exceptional pain, symptoms of shock, excessive bleeding—together or separately—are complained of or observed soon after a delivery, a vaginal examination should never be omitted, as by that neglect uterine inversion, partial or complete, may be overlooked.

To summarize the treatment of puerperal inversion now advocated:—(1) if there is little or no shock, reduction should be made at once, the placenta being first removed if still adherent; (2) if there is severe and serious shock energetic and immediate measures must be adopted to combat it, time not being wasted in attempts at replacement, which, if successful, might aggravate shock; these measure include hypodermics of ether, digitalin, strychnine and pituitary extracts, saline injections, stimulants and morphia; (3) when, later on, the condition has improved, taxis should be employed gently but scientifically with the aid of an anæsthetic; (4) in cases seen after the lapse of months or years, if moderate taxis fails, the uterus should be reinverted if possible by such an operation as that described.

The two non-puerperal examples of uterine inversion which have come under my care were the result, in each instance, of the growth of a cancerous tumour at the fundus. They are, so far as I know, unique, but there was no doubt clinically as to the correctness of the diagnosis of inversion and the historical investigations have been vouched for by experienced pathologists—Dr. Hugh Miller Galt, now pathologist to the Sussex County Hospital, Dr. John H.

Teacher, pathologist to the Glasgow Royal Infirmary, and Dr. Leslie Buchanan, of the West of Scotland Clinical Research Association. One of these cases I have already recorded at some length, and it is included in one of the lists compiled by Thorn in his statistical and biographical study of inversion. He had collected 83 cases resulting from the presence of new growths. The mortality was 8·5 per cent., the deaths being due to exhaustion and septic processes, only in one case from hæmorrhage alone. A fibroid tumour was the cause in the vast majority of cases, only four being from sarcoma, and one from cancer—that to be described.

The patient was 57 years of age, married, and a 4-para. The menopause had been reached in her forty-sixth year. For nearly twelve years she had excellent health and until four months before I saw her, at which time slight bleeding began. Gradually it increased, and she was told, on seeking medical advice, that there was a polypus. No surgical treatment was suggested, and for three months she was confined to bed without any cessation of the bleeding which latterly came in " floodings " and was accompanied by the passage of pieces of fleshy tissue. When I saw her she was startlingly ghastly in colour, feeble, breathless, and showing evidences of marked cardiac dilatation. After her removal to the Royal Samaritan Hospital we removed gently in pieces the greater part of a sloughing mass which filled the lower part of the vagina and was attached to the fundus of the inverted uterus. The openings into the tubes were clearly seen after the tumour had been removed and bimanual examination revealed the absence of the uterine body from its normal position. Later attempts at reduction by taxis proved unsuccessful, and, as the bleeding had been arrested by what had been already done, it was clearly not necessary to operate immediately on account of the displacement. In spite of stimulation and nourishment, however, the patient did not rally and the lethargy and collapse passed into coma, death supervening with no reasonable opportunity for successful operation presenting itself. The report on the tumour was that " it is undoubtedly a malignant tumour, composed chiefly of large epithelioid cells. . . . . There is no trace of fibromatous, muscular, or glandular structures at any part. It is carcinomatous, and of an endothelial type."

The other and later case, hitherto unrecorded, had, however, a happy ending. The patient was 56 years of age, unmarried, nulliparous, and was long past the menopause. For six months she had suffered from occasional fairly severe hæmorrhages and in the intervals, from a foul-smelling brown discharge mingled with pieces of firm tissue. Her life was passed in an unusually secluded fashion in a remote country district, and only a few days before I saw her had she consulted anyone. Dr. Kirkwood, Barrhill, and Dr. McKerrow, Ayr, recognized the seriousness of the condition and promptly sent her to

me and she was at once ordered into a Nursing Home. Not even a guess at the true diagnosis had been made by any of us as she would not permit a satisfactory vaginal examination to be made. These facts are mentioned in order to explain what ultimately happened. An examination under an anæsthetic was arranged, and one forenoon in the operating room this was carried out, an anæsthetist and a couple of nurses being with me. The vagina was found to be blocked by a gangrenous, friable tumour, which at first appeared to be a polypus, but further clearing away revealed as mainly composed of the inverted uterus. While in the act of detaching more of the tumour from the fundus my finger suddenly penetrated the thinned-out, diseased uterine wall. Septic material having thus been carried into the peritoneal cavity an awkward situation was created, no preparations having been made for the hysterectomy which was manifestly the proper operation to be done, and at once. A knife, needles, and ligature were, however, furnished by the Home, a pair of scissors and a few pairs of pressure forceps were fortunately in my bag, and, with the senior nurse as assistant, I opened the abdomen. The walls were fat and thick, while the absence of a fundus to grasp and our scanty supply of instruments made the operation not an easy one. The difficulties were successfully surmounted, however; panhysterectomy with double salpingo-oöphorectomy was performed. The patient never had a bad symptom afterwards nor gave the slightest anxiety, and she is alive and well to-day, five and a half years after the operation was performed. Dr. Teacher's report, confirmed by the West of Scotland Clinical Research Association, was that the specimen consisted of inverted uterus to which at the fundus was a perfect example of an endothelioma.

In Thorn's monograph it is stated that out of 83 cases of inversion due to intrauterine tumours, in no less than 12, in spite of cautious handling, was the uterus torn and the peritoneal cavity opened. This liability to perforation must always be held in remembrance, our constant vigilance being demanded when we are removing tumours of whatever structure from an inverted uterus.

Another point to be borne in mind is that it is a wise rule to take the existence of inversion for granted in the case of every submucous uterine tumour. Or, to put it in another form, our duty is not to take its absence for granted, but to disprove its existence by careful examination. Several instances have been recorded, and how many have been unrecorded no one can tell, in which, partial inversion existing without the surgeon's knowledge, the uterine wall has been cut, the peritoneal cavity opened, and fatal hæmorrhage has ensued.

The chief danger of chronic inversion is hæmorrhage, which is frequently very severe and leads to death from exhaustion. When to the inversion there is superadded either a myoma or a malignant tumour this danger is all the greater.

The only treatment of chronic pathological inversion worthy of consideration is the removal of any tumour present and either hysterotomy, as already described, or hysterectomy. Hysterotomy is the operation of selection when the patient is a young parous woman. It is contra-indicated and hysterectomy must be performed (1) if a malignant tumour is present; (2) if there is either thickening and hardening of the uterine wall or softening and atrophy of the musculature, and (3) if there are dense peritoneal adhesions binding down the uterus or fixing bladder or rectum. And finally, if hysterectomy is decided upon the abdominal rather than the vaginal route ought to be selected for the performance of the operation.

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The Intra-abdominal Pressure in Pregnancy.

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I. *Introduction. Observations of the pressure in the rectum in pregnancy; and a comparison with the pressure found in the non-pregnant for similar positions.*

Some years ago, working at an institution* in which single women who had become pregnant were not only confined but also lived for many months of their pregnancy, I discovered the pelvic floor musculature hypertrophies in pregnancy. This discovery—made at the time when the levator ani was believed to be more or less functionless at least in the matter of the pelvic visceral support—was sufficiently startling: for it corroborated very plainly the opposing view I had put forward,[17] and negatived completely the prevailing opinion. The statement that these muscles hypertrophy in pregnancy has appeared in my writings;[18] but, as far as I know, has neither been admitted nor refuted by contemporaries. Yet the fact is of considerable importance. It has a further significance: for if the pelvic floor resists the downthrust of the viscera, its hypertrophy in pregnancy can only mean that the visceral downthrust—the intra-abdominal pressure—is increased in pregnancy. But I was not the first to make this observation concerning these muscles, as I at first thought, for I found Dickinson had done so in 1889.[3] In a short paragraph he made a similar statement, but drew no conclusion from it; but his remark greatly pleased me, for it showed I was not alone in this opinion.

It was, however, some years before I knew anything of the pelvic floor musculature that I made my first experiment on the intra-abdominal pressure. At one time, I firmly believed in Matthews Duncan's retentive power of the abdomen,[4] and indeed began to write a paper about it. In connection with this I thought it wise to put the case to the test; so I obtained a rubber bag, connected it with a long glass tube, and having filled the bag and most of the tube with water, inserted the former into the vagina of a woman lately confined. I then caused the woman to rise from her bed, and expected to see the effect of the retentive power of the abdomen. Great was my surprise to find the water shot from the tube to the ceiling. So, having returned the patient to bed and removed the

* "The Home of Hope," 4, 5, and 6, Regent Square, W.C.

bag, I postponed *sine die* the repetition of an experiment so upsetting to one's philosophy.

It was only after I perceived the significance of the pelvic floor musculature that I returned to this examination. In the past there had been two prevailing opinions concerning the function of the levator ani muscles. It was first thought they play a part during defæcation: they were supposed to pull the anus and anal canal upwards over the descending fæcal mass as this is being expelled. And this is still taught by some physiologists, although the arrangement of the muscle fibres—their origin, course and insertions—shows it is quite an impossible action. The other was that the levator ani muscles are the relics of tail-moving muscles, and since the tail in man has disappeared these muscles were thought to be degenerate. That this is an untenable hypothesis, I showed in my first Hunterian Lectures.[19] In those lectures it became clear that the levator ani muscles are body wall muscles: with the coccygei, they close in the wide and diamond-shaped pelvic outlet, just as the anterior abdominal wall closes in the abdomen in the front and at the sides; and they act in the same way—their purpose is to cause a compression of the viscera. In this the abdominal wall and thoracic diaphragm play the chief and the active part; they compress the viscera and tend to squeeze them into the pelvis against the pelvic floor, the function of which is to resist the visceral descent and by opposing the thrust from above, to maintain it. Thus a compression of the viscera occurs, much increased during straining and bodily activity, but in virtue of the tone of these enclosing muscles persisting even during rest.

When we remember the abdomino-pelvic cavity is a closed space,[25] shut in on all sides by the muscular sheets referred to, that it is filled with viscera, visceral parts, visceral contents and tissue fluids (blood and lymph), all of which, except for the gas in the intestinal tract, though deformable, are incompressible, it becomes clear a pressure relation can easily be caused to exist between the contents of the cavity (the visceral mass) and the enclosing muscular walls. That the transversales compress the viscera is plain from their disposition, for they run from one side of the spine to the other around the visceral mass, and can have no other effect than to compress the visceral mass. So, too, in the case of the thoracic diaphragm, from the arched course of its fibres over the epigastric viscera, a similar reaction occurs. Keith[11] has shown, and I also have shown,[21] the thoracic diaphragm is not a muscle specific to respiration; but that it is continuously pressing downwards on the epigastric viscera, causing with the abdominal wall a positive pressure amidst them. Hasse,[7] in 1886, came to this conclusion; and Halls Dally[2] says: "One of the chief functions which the diaphragm performs is that of a compressor of the abdominal contents."

The diaphragm and abdominal wall musculature (flank muscles) are co-ordinated, reacting always together as antagonists, compressing the visceral mass between them for a circulatory end, squeezing the blood into the thorax (heart), controlling the rate of blood flow through the abdominal viscera, and thus influencing metabolism. Not only anatomical and physiological considerations show this is so, but clinical experience affords alike proof of the combined action of these musculatures, and indicates their purposive end, which their phylogeny confirms. Wynter,[28] in an important paper, has shown that in pericarditis "an inhibition of the diaphragm occurs" with which is associated an absence of abdominal movements, not due to muscular rigidity which is lacking. "The inertness of the diaphragm is not merely inferred, but by *x*-ray screen examination can be actually observed, the midriff mounting high into the thorax, and exhibiting no contraction." That the abdominal wall is correspondingly weakened or thrown out of action (reflexly), is shown by the "tendency to dilatation of the hollow abdominal organs, especially the stomach"; whilst the functions of these two musculatures is not only indicated by the abnormal reactions in pericarditis, but also by the cyanosis which occurs.

Besides the flank muscles, the action of the recti abdominis is important, and must be referred to. It is plain, in individuals with enlarged abdomen, as in corpulent people, in whom the recti, being protruded forwards, run in a curved course from above downwards, will act in the same way as the transversales; in virtue of their tone, that is even during rest, causing a compression of the visceral mass; but that in thin individuals, with scaphoid abdomen, they will act in just the opposite way, tending to diminish the pressure within the abdomen. The same action of the recti will come into play, even in people with a well-developed abdomen, if the spine be extended and a deep breath taken; for the posture causes the recti to assume a recurved course.

The abdominal wall and the thoracic diaphragm, acting together, plainly form the effective mechanism compressing the visceral mass, because of their excursions: the pelvic floor musculature, from its position can have little direct action. It functions by resisting the visceral downthrust, and so causes the actions of the other enclosing muscles to become effective.

The compression of the contained viscera, caused in this way, acting with the effect of gravity upon them (*i.e.*, with their weight), is known as the intra-abdomino-pelvic, or more briefly, the intra-abdominal pressure. It is different in different parts of the abdomen for the same posture; and it is different in the same part with different postures. Except in the knee-chest and allied positions, it is always greatest in the pelvis, least in the epigastrium. It varies slightly with respiration; is greatly increased by bodily movements,

showing marked variations; is much increased by straining, but most increased by cough.[21] So also it varies with the volume of the visceral mass, being greater when this is greater, less when this is less.

Here are some of the approximate values found in the rectum for different postures in individuals with flat abdomen:—

Left side	6 to 8 mm. Hg.
Flat on back	10 to 14 mm. Hg.
Standing erect	20 to 28 mm. Hg.*

I have only taken the pressure values in the stomach in one person other than myself, and she was near full time of pregnancy, and will be referred to later. But Moritz has taken a great many, both on himself and on others.[14] Some of his were cases of pregnancy; of those taken in the non-pregnant he makes no comment as to whether the abdomen was full or not. He gives the following figures as the average for various postures (in cm. of water):—

Left side	14·7 cm. water
Right side	3·8 cm. water
Back	6·3 cm. water = 4·6 mm. Hg.
Standing	7 cm. water = 5·1 mm. Hg.
Sitting	8 cm. water = 5·8 mm. Hg.

It will be seen the values in the stomach are very much lower than those in the rectum for corresponding positions, except in the case of the left lateral; in this, the relatively high value in the stomach, as compared with that found in the right lateral position, was explained by Moritz, probably correctly, by the weight of the liver pressing upon the stomach in the former, but not in the latter. Thus the pressure in the stomach, like that in the rectum, shows considerable differences for difference in posture. Like it, too, it undergoes marked variations with bodily movements, and is considerably increased by straining, vomiting and cough.

Now when I came to examine the pressure in the rectum in the inmates of the Home referred to, in the great majority I found much higher values than in the non-pregnant. I have records of 24 cases. Of these, 19 were primigravidæ; 5 were second cases. Records from two non-pregnant women are given as guides to the normal, making

* It is assumed that the pressure found within the rectum indicates the pressure immediately outside it, between it and the surrounding visceral parts, *i.e.* the intra-pelvic pressure: and is not due to a tonic contraction of the rectal musculature. The differences found in different postures, the variations occurring with movements, the negative pressure found in the knee-chest position show this is so. For the mercury in the manometer responds immediately to such changes, and even excursions due to respiration are readily seen. Other reasons in support of this opinion were advanced in my lecture "The Intra-Abdomino-Pelvic Pressure in Man." (20.) The same arguments apply to the pressure found in the stomach, *mutatis mutandis*. See also Moritz (14).

26 cases. Many of the patients were examined at different times of their pregnancy, and 11 of the primigravidæ and 3 of the secundigravidæ after labour as well, making 58 observations in all. It will be noticed two of the primigravidæ were suffering from the toxæmia of pregnancy; I include them here because they came in the series.†

My method of investigation was divided into two parts. The first referred to the volume of the abdomen and size of the pelvis, and to the state of the muscles; the second to the pressure found in the rectum. As regards the first, I measured the diameters of the pelvis; the girth of the abdomen, at the level of the thoracic base and at the umbilicus, both at rest and at the height of a deep breath; the separation of the recti; and the distance along the superficies of the abdomen from the summit of the symphysis pubis to the ensiform cartilage and on to the suprasternal notch, the latter measurement being taken both at rest and at height of deep breath. All these were taken with the patient lying flat on her back; but when the separation of the recti was being measured the patient was asked to raise her head slightly to bring the margins of the recti into prominence so that they could be defined.

When this had been done, the patient having turned on her side, I introduced a small bag (an ordinary thin rubber finger-stall), partially distended with air, and connected by a tube with a mercurial manometer (such as I show) into the rectum, and recorded the pressure in different postures. My method was to keep my eye on the manometer, and to call out the figures, which were entered in a book by someone else.* In the records submitted the pressure values are given in the sequence in which they were usually obtained. After the bag was got into the rectum, the first figure was read out. The patient was then asked to cough; the mercury then should rise to a considerable height and return immediately. If it did not rise well it showed something was wrong, and the bag was adjusted. The patient was next asked to turn on her back and lie quite flat. The resulting pressure was always higher than when on the side, as it is in the non-pregnant (a significant relation), and in some cases almost as high as when she was standing erect (as in Cases 7, 8, 9, 10 and 14; in 15 it was even higher).

† These records, upon which the argument in this paper and its conclusion do not depend, will be found in the *Proceedings of the Roy. Soc. Med.*, Obstet. and Gyn. Sec., for June 1913.

* The figures called out did not represent the pressures to which they referred. This was worked out, subsequent to the examination, by subtracting the figure at which the mercury stood for any one posture from the figure representing the zero point; and the remainder was then doubled, since as the mercury rises in one arm of the manometer, it sinks as much in the other.

Next the patient got into the knee-chest position. To obtain a negative pressure the thighs had to be vertical, the sternum on the couch, the back well arched. Even then in some cases no negative pressure was found; for instance, in the toxæmic cases. Then she was turned on her side again, and the pressure again read. It was often found after this manœuvring that the reading now obtained was lower than when the bag was first introduced for the same position. The agitation, fear of the unexpected, had passed away; the patient had got accustomed to the performance, and the muscles, we may take it, were not more contracted than usual for this position. Moreover, the diminution of the pressure in the rectum and the variations caused by movement from one posture to another had allowed the bag to adjust itself to its surroundings, so probably the reading gave a true value of the pressure.

There is a remarkable difference exhibited by a comparison of the pressure value found in the left lateral position—the patient lying with the thighs and legs flexed at ease—in cases of pregnancy with those found in non-pregnant women with flat abdomen in similar position. Whereas in the latter the pressure was only 6 to 8 mm. Hg., in the former it was often twice as much and in some cases more than three times (as in Cases 1, 7, 9, 12, 13, 14, 15, 16); and especially was this pressure marked in the two cases of toxæmia of pregnancy (Cases 18 and 19, 18 mm. Hg. in the first, and 22 to 37 mm. Hg. in the second).

The patient was next asked to get off the couch and to stand straight up. The pressure values found were usually much higher than in the non-pregnant, but not so much as to be in proportion to the values found in the lateral position and when on the back: 30 mm. Hg. was quite common. In the toxæmic cases they were extremely high; in the second the highest of all. The patient, still standing, was now asked to bend forwards; the pressure generally fell as it does in the non-pregnant, but nothing to the like extent. Next she was asked to catch hold of the leg of the table and to raise it—generally with a considerable elevation of the pressure. Next she got back to the couch and the pressure in the left lateral position again read; and, finally, was asked to strain, and then the tube was removed. On straining, the pressure did not always rise as much as one expected.

In many cases in the columns double figures are given. You will not be surprised at those variations, which represent the highest and lowest of a reading. Where single figures are given the pressure was quite steady, as it often is, and represents the pressure value. It must be remembered that even small movements cause changes in the pressure and that slight changes in posture also do so.

II. *A criticism of the observations and arguments of those who say the intra-abdominal pressure is not increased in pregnancy, and indications that the reverse is possible.*

Now the question is: What is the interpretation of the increased pressure found in the rectum in pregnancy? Is it due to the increased weight of the uterus and its contents? Or is it due to an increased tonic contraction of the abdominal wall and thoracic diaphragm as well, so that the pressure above the uterus is also increased? In the past, the former opinion seems to have prevailed. For, although many obstetricians, from the time of Smellie, have thought in an indefined sort of way that the pregnant uterus, quite apart from its weight, causes a pressure within the abdomen, the criticism made by Matthews Duncan in 1879, that not "the slightest good reason" had been given for believing there is any increase of pressure,[5] has up till now remained unanswered.

And those who have investigated this pressure in pregnancy and in other conditions have unanimously come to the opinion that the abdominal wall and thoracic diaphragm play no part in the increase of rectal pressure; they have thought that the pressure above the uterus in pregnancy—for instance, on the pancreas and kidneys, and on the liver and spleen—is not increased. They say the abdominal wall yields to the distension of the uterus, like it does when food is taken into the stomach, and by a relaxation prevents a rise of pressure.

Thus Schatz,[23] in 1872, measured the pressure in the rectum by connecting it with a water manometer in two cases of normal pregnancy—the first a moderately strong secundigravida, 22 years old, in the ninth month of pregnancy; the second, a normally formed primigravida, 25 years old, at the end of the sixth month of pregnancy—and, in spite of the much higher values obtained in these cases, as compared with those he had found in the non-pregnant, said: "The intra-abdominal pressure often does not rise at all through the marked distension of the abdomen by the uterus, or it even sinks at the end of pregnancy." [22]

The following are the figures Schatz gives. Side by side with these I place the figures given by him as the pressure values in the rectum for corresponding positions in the non-pregnant—all in cm. of water:—

Position.	Case 1.	Case 2.	Non-pregnant.
Flat on back	36	30	14
Standing erect ...	36	34	28
Sitting upright ...	40	36	32
Lateral position ...	18	20	10
Semi-prone	8	—	8
Knee-hand	2	—	4
Knee-chest	−6	—	−8

Schatz explained the marked increase in pregnancy as due to the increased weight of the uterus—which the readings in the supine, but especially in the lateral position, can hardly be said to support. He said the intercostal muscles hypertrophy in pregnancy, and by raising the ribs cause an expansion of the thoracic base, and thus either diminish the pressure on the epigastric viscera, or prevent it rising, as Matthews Duncan thought. But he went further, and said that in the later months of pregnancy the enlarged uterus acts as a prop, and by thrusting the abdominal wall forwards prevents it from compressing the epigastric viscera as much as it otherwise would. Thus he came to the opinion that the pressure in this region is not raised at all or even sinks at the end of pregnancy.

Nor did Moritz [14] (1895) believe the pressure was raised in the stomach in pregnancy. He gives the following figures as the minimal and maximal pressures found in the stomach in the sitting posture, in 5 cases:—

(*a*) 9th month, ? para,* 21 years	...	8 to 12 cm. water
(*b*) 8th month, ii-para, 21 years	...	15 to 18 cm. water
(*c*) 7th month, i-para, 28 years	...	7 to 11 cm. water
(*d*) 9th month, i-para, 26 years	...	12 to 22 cm. water
(*e*) 9th month, i-para, 22 years	...	5 to 9 cm. water

* "para" should presumably read "gravida."

He says: "Only in two of these cases, in *b* and *d*, did the maximal pressure exceed the maximal limit of 16 cm. of the normal condition. In the other cases the maximal pressure was within the normal limit, whilst the minimal fell within it in all cases."

Comparing these figures with those Moritz gives for the non-pregnant, we find [15] that the average of numerous determinations on himself of the pressure in the stomach in the sitting posture was only 8 cm. water. Only in the last of the cases of pregnancy was the average lower than this; so it is plain from his figures that the stomach pressure in pregnancy not only may be greater, but is usually greater, than in the non-pregnant, even though the increase be small. And they at once put Schatz's supposition that the pressure in the stomach either remains the same or even falls in pregnancy out of court. The fact that the pressure in the stomach is always positive shows how erroneous was Matthews Duncan's hypothesis.

But Moritz has given other figures for the pressure in the stomach in pregnancy. Side by side with these I put the figures given by Moritz as the average of six determinations taken on himself in corresponding positions which will serve as an index to the non-pregnant, and which he himself gives as the normal:—

(*C*) Secundipara, aged 21, 8th month of pregnancy.			Non-pregnant.
Back	16 to 18 cm. water	.....	6·3 cm. water
Left side ...	18 to 19 cm. water	.....	14·7 cm. water
Right side ...	18 to 19 cm. water	.....	3·8 cm. water
(*D*) Primipara, aged 26, 9th month.			
Right side ...	7 to 9 cm. water	.....	3·8 cm. water
Sitting ...	12 to 13 cm. water	.....	8 cm. water
Left side ...	16 to 18 cm. water	.....	14·7 cm. water
(*E*) Primipara, aged 22, 9th month.			
Back	11 to 12 cm. water	.....	6·3 cm. water
Left side ...	15 to 16 cm. water	.....	14·7 cm. water
Right side ...	7 to 9 cm. water	.....	3·8 cm. water

Now comparison of the pressures found in the cases of pregnancy with those in the non-pregnant show at once that the values in pregnancy are considerably greater. But Moritz has given figures in a girl, presumably non-pregnant, which compare very favourably with those of Cases D and E; and in one of the six determinations on himself, from which the averages given were taken, he gives very similar figures.

Case B.—A girl, aged 20 (presumably non-pregnant).

Right side	6 to 8 cm. water
Left side	14 to 20 cm. water
Back	12 cm. water

Case A (Moritz himself).—Experiment 6.

Back	12 to 13 cm. water
Right side	5 cm. water
Left side	19 cm. water

This being so, we will discount Cases D and E. The increase such as they show may have been due to pregnancy, or to some other adventitious cause. But let us fasten our attention on Case C. It is plain at once there is something wrong here. For in this case the pressure in the stomach in the left lateral position is not only greater than that Moritz gives as the average for that position in the non-pregnant, but the pressure in the right lateral position, which usually is much lower than that in the left (because of the liver weight) is here equal to the pressure in the left lateral position. In *all* the other cases it is much lower. In Case A (Experiment 6), in which Moritz found in himself the pressure in the left lateral position to be 19 cm. water, in the right it was only 5 cm.! This is a significant difference. The fact that the pressures found in these two positions in Case C were the same, and very nearly the same as that found when on the back, is of much more importance than the absolute values.

Moritz does not attempt an explanation of the figures obtained in

this case, which he describes as an isolated exception. Isolated exceptions, however, are of great value; they are indications of the real state of affairs. They probe generalizations, and if the generalization takes no account of them, or cannot explain them, or is inconsistent with their existence, they show the generalization is invalid—that the rule is no rule. Provided one can accept these figures as really showing the pressures existing in the three positions—and Moritz had so much practice and his technique was so good, that I think one can accept them, for he says not a word to lead one to suppose they were erroneous—what explanation of them can be given other than that in this case the pressure in the stomach was increased, and increased by an increased tonic contraction of the abdominal wall and thoracic diaphragm—the only possibility? For just as it is easily intelligible that when the tone of these musculatures is low, as it usually is in the lateral positions, the weight of the liver should cause an appreciable difference in the pressure found in the stomach, according as to whether the liver is situated above it (as in the left lateral position) or below it (as in the right); so it is obvious the effect of the liver weight will become less and less important as a factor in the stomach pressure as the tension of these musculatures is increased.

Moritz, who believed the pressure in the abdomen in the non-pregnant is due to the visceral weight, and not at all, or scarcely at all, to the tonic contraction of the enclosing musculature, did not attempt to explain the increase or tendency to increase in pregnancy, as shown in these cases—he passes it by. And Hörmann, in 1905, referring to them, says the increase Moritz found was at most quite unimportant, and so dismisses it. It is especially noteworthy, says Hörmann,[9] that in consequence of the extraordinary elasticity of the abdominal wall musculature, very considerable increase in volume of the abdominal contents—both physiological, as occurs on ingesting large meals and in pregnancy—and pathological due to slowly growing tumours and gradually increasing ascites—may occur without causing any tension of the abdominal wall musculature, and therefore without producing a rise of pressure within the abdomen due to this cause. He tells us he has made numerous observations of the pressure within the rectum, "in lying-in women, individuals with flat abdomen, in late pregnancy, in patients with large tumours —*e.g.*, considerable ascites"; and that he "found no difference in the pressure which was not completely explained by the altered statistical conditions." He says: "Even if I found in the latter months of pregnancy in the erect posture average values of from 30 to 34 cm. water, and on the other hand in lying-in women and individuals in whom the abdomen was flat and lax, values of only 16 to 18 cm. water, this difference is adequately explained by the weight of the uterus with the liquor amnii and fœtus bearing on the

rectum in the former cases, without a tension of the abdominal wall participating in its production. Even with quite large tumours—*e.g.*, ascites (due to carcinoma of ovary, 20 cm.), large fibroid reaching to the navel (22 cm.), ovarian tumour reaching to the costal arch (26 cm.), I found no higher pressure values than Schatz found in very many measurements on normal individuals in the rectum when quietly standing."

That increase in volume of the abdominal contents may occur without increase in pressure has been shown by many writers. Thus Braune [1] (1865), the first to study the pressure within the abdomen, found that the pressure within the rectum remained the same whether large or small enemata were injected into it, or whether the subject had eaten little or much. Weisker [27] (1888) corroborated this, and explained it in the same way: that it is due to the extraordinarily great elasticity of the belly wall musculature. Kelling [12] (1895) found the pressure in the rectum of two individuals with the stomach empty to be 29 to 33 cm. water, and 22 to 24 cm. water respectively; and after each had drunk half a litre of cold water, the rectal pressure in the first had actually fallen to 28 to 29 cm. water, whilst in the second it was neither greater nor less, but remained the same as before. Moritz (1895) found that the passage of moderate quantities of liquid or of air into the stomach caused either no rise of stomach pressure at all, or only a very temporary elevation; indeed, after taking 500 c.cm. of cold water, the pressure fell 1 to 2 cm. water; and on another occasion after drinking 400 c.cm. of cold milk, the pressure diminished by 3 cm. water. By rapid inflation of the stomach with 300 c.cm. of air, a temporary rise of 12 cm. water, lasting less than half a minute, occurred; then the pressure fell, returning to its previous level, which was 7 cm. water, so that a total pressure of 19 cm. had been registered. A few minutes later another 350 c.cm. of air was pumped in; this time a total pressure of 16 cm. water occurred. Both times a painful feeling of distension was produced; the first passed rapidly away, but the second continued so that the experiment had to be ended. Hörmann (1905), after measuring the pressure in the rectum, the subject standing erect and breathing quietly, caused one teaspoonful of tartaric acid and then two teaspoonfuls of sodium bicarbonate, each dissolved in a little water, to be swallowed, so that the stomach was markedly distended by the resulting gas, and its outline became clearly discernible; yet in not one of the four cases did the pressure in the rectum alter in the least, in spite of the fact that the pressure in the stomach was considerably raised, as shown by inspection and by the acute sense of distension experienced by the subject. Finally, Hertz,[8] investigating the sensation of fulness caused by distension of the stomach with gas, found the intra-gastric pressure was not continuously increased by successive injections of air.

That the ingestion of moderate quantities of food, *e.g.*, of milk, into the stomach does not cause a rise of pressure, either within the stomach or between it and adjacent organs, may be allowed. Indeed, as we have just seen, Moritz found on two occasions an appreciable fall. It is, however, to be remembered that even slight changes in the posture of the body, changes in attitude, *e.g.*, flexion and extension of the spine, elevation of the chest, cause considerable changes in the pressure in the stomach even when its volume is constant. But we may admit that in the stomach no great rise, or no rise, or a slight fall, occurs in the pressure when the stomach volume is moderately increased, especially in people with flat abdomen; and that this fall is caused by a reflex relaxation of the abdominal wall muscles. And it has seemed to me the same may happen in early pregnancy; that in the early stages the enlarging of the uterus is associated also with a diminution in tone of the enclosing musculatures, with a fall of intra-abdominal pressure, occurring especially at night. In this way I have explained to myself the morning sickness of pregnancy; for such a relaxation would affect the epigastric viscera, permitting a nocturnal dilatation of the stomach and probably interfering with the normal functioning of the liver. But the admission of a relaxation of the abdominal wall musculature and of the thoracic diaphragm with ingestion of food, or with enlargement of the uterus consequent on the growth of an ovum in the early stages, does not show the intra-abdominal pressure is not increased and maintained increased in mid- and late pregnancy.

In respect to this non-increase of pressure in the stomach (and epigastrium) on taking food, Kelling (1895) makes an interesting and enlightening observation. We can understand, he says, that the pressure in the rectum need not necessarily increase when we load the stomach with food, since it is one of the simplest of hydrostatic laws that the pressure on the floor of a vessel is not dependent on the mass of contents, *e.g.*, water, it contains, but only on the vertical distance of the floor from the surface level of the contents. The earlier writers laid great emphasis on the observation that the pressure in the rectum is such as to support a column of water as high as the highest part of the abdominal cavity for any position; and, since, they said, the specific gravity of the collective viscera (with contents) equals approximately that of water, they argued that the pressure in the rectum is due to the visceral weight; and thus they concluded the belly wall musculature plays no part in its production. But the pressure in the rectum in the lateral position and in the supine position cannot be explained on that hypothesis; nor can the fact that the pressure in the rectum in these positions is greater than the pressure in the stomach in the right lateral and supine positions respectively. And, it is obvious if the pressure in the rectum, *e.g.*, in the erect posture, is due to the weight of the visceral

column, that however much the visceral mass should increase, the rectal pressure should not vary unless the visceral height also varies; that change in the pressure should correspond with change in the height of the visceral column, *i.e.*, with the position of the diaphragm. Indeed, Weisker attributed the respiratory excursions of rectal pressure to this change in level of the diaphragm—a conception unpleasantly illuminated by finding that on abdominal inspiration the rectal pressure rises as the diaphragm descends, and the height of the visceral column reduces.

The application of Kelling's enunciation—all unconsciously made—enlightened Hörmann's position with a lurid glare, rendering conspicuous his hidden contradiction; for, although Kelling was forced later (1903)[13] to admit by his own reasoning that the muscular walls of the abdominal cavity do participate in the pressure production, at his time (1895) he held that the pressure in the rectum is due to the visceral weight alone, and not at all to the belly wall musculature. For, the validity of the hydrostatic law referred to being admitted, and allowing its application to the physical conditions within the abdomen,* it is clear that Hörmann's explanation of the increased pressure values found in the rectum in pregnancy is invalid; the increase cannot be due to the increased visceral weight, for the specific gravity of the pregnant uterus with contents, is approximately that of other viscera, and if the specific gravity of all as assumed is approximately that of water, the level of the diaphragm is not sufficiently elevated in pregnancy to account for it. According to Hörmann's figures, the height of the visceral column would have to be increased 12 to 18cm., the diaphragm to be raised more than four to seven inches, to correspond with them. Moreover, the variations found to occur in different pregnant women are not explained by a variation in height of the visceral column, or indeed by a

* It is unnecessary for me to go into this point, since Hörmann's explanation is shown to be invalid by other reasons. All the earlier writers seem to have tacitly assumed this law is applicable to the physical conditions in the abdomen; and their hypotheses were based on this assumption. The argument in the text meets and confutes them on their own ground.

But Hörmann probably would not accept the application of this law to the physical conditions in the abdomen. It is indeed difficult to pin Hörmann down: for whilst he did not believe the abdominal wall and diaphragm play any great part, or indeed any part, in the pressure found in the viscera, but imputed the pressure to the weight of superjacent organs, he at the same time believed these superjacent organs are supported by their ligaments or mesenteries. If the pressure in the rectum is due to the weight of the viscera above, obviously these cannot be supported by their connections. Kelling in 1895 saw this difficulty, and believing the pressure (at that time) was due to the visceral weight, recognized in this a reason for rejecting the idea that the viscera are supported by their mesenteries, etc. "The viscera rest upon each other as on cushions."

difference in weight or of volume of the visceral mass. In some cases the pressure is greater than in others; is, for example, greater as a rule in primigravidæ than in multigravidæ, in spite of the child generally being larger and heavier in the latter. And in others, even in primigravidæ, the pressure is not greater, or not much greater, than in the non-pregnant, although the pregnancy is advanced and in other respects quite normal (as in Cases 2, 3 and 4 of the records submitted). Further, in the same patient, the rectal pressure is greater when sitting than when standing, as Schatz's cases show (so also Cases 9 and 10 of my list), in spite of the fact that the height of the visceral column remains approximately the same; or, indeed, on account of the flexion of the spine and the rotation forwards and upwards of the pelvis which occurs on sitting, is probably reduced (at any rate, is it not increased in height sufficiently to correspond to an increase of 12 mm. Hg., as occurred in Case 9). Schatz's explanation of this—that it is due to the pressure upwards upon the soft parts occluding the pelvic outlet by the surface on which the individual is sitting—will scarcely find credence.

Again, Hörmann states he has found the pressure in the rectum in a case of ascites, in one of a fibroid growth of the uterus and in one of a large ovarian cyst to be no more than Schatz found in many normal individuals. If Hörmann suggests, as he plainly appears to do, that such tumours may arise in normal individuals without causing an increase of pressure within the rectum, the question immediately arises: Why should the pressure be raised in pregnancy, and not raised with other tumour formations, the weight of which may equal or exceed the weight of the pregnant uterus and contents at term? As a matter of fact, Hörmann found, after removal of the fibroid, and of the ovarian cyst in the respective cases, that the rectal pressure was reduced in each—from 22 cm. to 16 cm. water in the former, and from 26 to 19 cm. water in the latter; all the measurements being taken in the erect posture. The fibroid, he says, was larger than a man's head; before removal it reached the navel, at which level the abdominal circumference was 87 cm. (35 inches); the abdominal wall was not stretched (nicht gespannt), but was bulged forwards, particularly in the lower part; after removal of the tumour the abdomen was flat. What the weight of the ovarian cyst was we do not know, but Hörmann tells us it was a very large tumour, that it reached the ribs, that the abdomen was as much distended by it as by the pregnant uterus at term, the girth of the abdomen being one metre (39 inches); and that after its removal the abdomen was flat and its walls lax. In this case, at least, we shall not go very far wrong in assuming the weight of the ovarian cyst to have approximated that of the pregnant uterus at term; but whilst Hörmann found the rectal pressure in pregnancy to

be as much as from 30 to 34 cm. water, the rectal pressure in this case of ovarian cyst was only 26 cm. water. And in the patient with ascites, due to a malignant tumour of the ovary (carcinoma), the pressure in the rectum in the erect posture was only 20 cm. water, although the circumference of the abdomen at the level of the navel was 96 cm. (38 inches), greater that is than is usual in pregnancy, and the abdominal wall was considerably stretched (sehr gespannt); whilst after removal of a very considerable amount of exudate (eines sehr reichlichen ascites—amount not given) the pressure in the rectum was still 20 cm. water, although the abdominal girth now measured 80 cm. (32 inches).

It is evident that Hörmann's explanation of these values contains a contradiction; similar increase in volume or in mass of the abdominal contents should result in similar pressure values, but they do not. It therefore follows that the pressure values are not due, at least by itself, to the visceral weight; but that some other factor is involved in their production; and the only other possibility, the only other factor, is the force exerted by the "tension" of the abdominal wall and other musculatures enclosing the abdomino-pelvic viscera.

(To be Continued).

A Preliminary Investigation concerning the Glycogen Content of the Mucous Membrane of the Fallopian Tube

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This paper comprises the results of a preliminary inquiry into the glycogen content of the Fallopian tube. It was undertaken at the suggestion of Dr. Ascheim, Director of the Laboratorium in the Frauenklinik of the Königlisches Charité Krankenhaus, Berlin, who has himself investigated very thoroughly the cyclic variations in the glycogen content of the endometrium. No one had as yet studied the problem in the Fallopian tube. In the case of the uterus the work of Hitschmann and Adler acted as a great stimulus to the investigation of the chemico-histological changes in the endometrium. These observers showed that undoubtedly the uterine mucous membrane underwent cyclic alterations in connection with the interval between successive menstrual periods. They showed that the whole period during which these changes were in progress, namely, the interval from one menstruation to the next, could be divided into four distinct stages, in each of which the mucous membrane presented a characteristic picture. They named these four periods the premenstrual, menstrual, post-menstrual and interval periods. The premenstrual stage, covering the interval from six to seven days before menstruation to the active onset of the flow, is characterized by the enlargement and distension of the glands, which are filled with secretion. The epithelial cells are also larger than at any other period; they look pale and distended, their nuclei staining indifferently. The protoplasm presents a somewhat granular appearance. In short, the epithelial cells show all the evidence of being actively engaged in secreting. These authors also found that the stroma cells in this stage, particularly those in the more superficial portions of the endometrium, tended to become enlarged, so as to resemble decidual cells.

In the menstrual period the glands are reduced in size, their lumen narrows and is no longer filled with secretions; the gland cells lose their swollen appearance and tend to become flattened, while here and there are seen extravasations of blood between, and sometimes inside, the glands.

Post-menstrually the glands are small and tend to be quite straight. The epithelial cells are of low type. All evidence of secretory activity is wanting, except in perhaps a few isolated glands.

In the interval period, commencing a few days after menstruation, the glands show a tendency to become somewhat more tortuous and the epithelial cells somewhat less low, and so, gradually, become established once more the premenstrual type of gland, stroma and epithelial cell.

Following on this interesting work came the discovery by Lubarsch of the existence of glycogen in the uterine mucous membrane. This observation was confirmed by Gierke, who, however, at first failed to demonstrate its presence, but afterwards not only satisfied himself of its existence, but was so impressed by the marked variations in the amount present that he suggested a probable cyclic variation comparable to the cyclic structural changes described by Hitschmann and Adler. The matter was then further investigated by Ascheim and Wegelin, who were able to show that such a cyclic change actually did occur, and that, whereas during the menstrual, post-menstrual and interval stages but little glycogen, or none at all, was present, in the premenstrual stage the glycogen content of the epithelial and stroma cells was extremely large, so that, when appropriately stained, the protoplasm of the epithelial cells in the glands appeared usually of a uniform brilliant bright red. Ascheim found that both the surface epithelial cells and the gland cells contained glycogen. The glycogen during this stage could also be seen in the gland lumen in the form of granules of various sizes mixed up wih the mucus and other products of the secretory cells' activity. Lubarsch considered that in inflammatory conditions epithelial cells and also connective tissue and endothelial cells are capable of containing much glycogen. Both Ascheim and Wegelin found glycogen in the swollen decidual-like cells of the premenstrual period, but none in the post-menstrual or early part of the interval. The gland cells during these two later periods contain either no glycogen or very little. Such leucocytes as are met in the endometrium contain glycogen. In the second half of the interval period, although the majority of the glands contain no glycogen, still very often a few do. The glycogen granules are often very definitely arranged inside the cells, being sometimes collected basally, or towards the lumen, or again all to one or other side. In other cases the protoplasm is uniformly stuffed. The nuclei are always glycogen-free. In the lumen it occurs as distinct droplets of various sizes or as irregular granular masses of bright red colour in the Best method of staining. Apparently it can pass from the cell into the lumen of the gland without the former having to undergo total disintegration. The cervical glands are glycogen-free. During pregnancy Wegelin found much glycogen in the glands and decidual cells. In three cases where abortion had taken place thirty days to six weeks before the curettage the decidual cells of the serotina still contained glycogen. Wegelin found that, in general, when

inflammatory changes were present in the endometrium, the glycogen content was increased, but never to the amount normally present during the premenstrual period.

Cl. Bernhard long ago showed that glycogen was normally present in the liver cells. It belongs to the polysaccharides of the formula $C_6H_{10}O_5$, and is a white amorphous powder which disolves in water, yielding an opalescent solution, and is precipitated by alcohol. Probably there are different kinds of glycogen present in the liver, as only part can be extracted with hot water, the remainder requiring more elaborate treatment to bring about its recovery from the tissues. By means of ptyalin it is converted into dextrose. With iodine it stains brown, and this colour reaction is utilized in demonstrating its presence by the Weigert method and the more recent Lubarsch modification of the Weigert method. Both these methods are, however, superseded by Best's kalium karmin method, which yields much more lasting preparations. With the exceptions of the granules in mast cells, mucus in goblet cells, and calcareous material, kalium karmin is a specific stain for glycogen. I found that paraffin sections yielded equally good results as celloidin sections. To avoid troublesome precipitation in employing Best's method, as much differentiating fluid as possible must be used after the specific glycogen stain, short of decolourizing any glycogen that may be present; rapid examinations under the microscope determine how far treatment with the solution can be pushed.

Glycogen is distributed throughout both the vegetable and animal kingdoms. In the embryo it is present in considerable quantity. It is always to be found in covering epithelium, striped muscle fibres and cartilage. It occurs less constantly in the epithelium of many glands, suprarenals, pancreas, heart, smooth muscle and serosa-epithelium. In the liver glycogen appears for the first time in the later months of intra-uterine life. After birth glycogen is also normally present in the body, but in proportionally less quantity; thus its presence is constant in cartilage and many-layered epithelium. Other structures, such as nerves, breast-tissue, thyroid, pancreas, and pituitary, never contain it. In the blood it is normally present in the plasma and polymorphonuclear leucocytes. Both liver and muscle show considerable variations in the amount present, depending on the activity of metabolism and the amount of muscular exertion. The kidneys and lymph glands are practically glycogen-free. Cl. Bernhard found it in the placenta. Langhan studied its disposition in this structure more closely, and found that it was contained in the villi, Langhans' cells and the decidual cells. Driessen confirmed these findings, and showed that it was also present in the glands in the earlier months of pregnancy, but that in the second half of pregnancy it was absent. Broers found it in the musculature of the pregnant uterus. In diabetes the amount in the

blood is increased, and Ehrlich found it in the epithelial cells of the kidney. In inflammatory conditions the leucocytes are full of it. Amongst tumours it occurs in such as consist of tissue which normally contains glycogen, as chondromata, squamous epitheliomata, but also in those composed of connective-tissue cells and endotheliomata. Particularly rich in glycogen are hypernephromata and chorioepitheliomata. In the corpus uteri fœtalis Ascheim found glycogen always absent. As a rule post-climacteric uteri are glycogen-free, or contain mere traces. The glycogen present in the decidual cells seems to be of the " store-house " type, as is the case in the liver. Probably the decidua acts as a local depot for the supply of nutritive material, in part under the form of glycogen, to the rapidly growing embryo.

Glycogen in the Mucous Membrane of the Tube.

The material examined comprised the Fallopian tubes from 29 gynæcological and obstetrical cases of different kinds operated on in the Frauenklinik of the Koniglisches Charité Krankenhaus, Berlin, and those from a still-born full-time fœtus. The operations were for uterine rupture, fibromyoma, carcinoma ovarii, pregnancy complicated by fibroids, salpingitis, metritis, carcinoma of cervix, tubal pregnancy, pregnancy in a case of phthisis, and ovarian cyst. The only post mortem material was that from the full-time fœtus. The tissue was put almost immediately after removal by operation into absolute alcohol. It is important that as little time as possible elapse between removal and fixation in alcohol, as glycogen begins to disintegrate very soon after the death of the cells containing it. Paraffin embedding was employed and the sections cut of between 8μ and 10μ thickness. With a view to comparing the amounts of glycogen in different preparations it was found more useful to preserve a uniform thickness for the sections; thus in 5μ sections the cells appear to contain much less glycogen than in 12μ sections, even though the tissue be identical. When possible the endometrium was examined along with the corresponding tube. The different portions of the tube, when available, were separately investigated.

With each batch of slides prepared a " control," which was known to contain glycogen, was also stained. For the demonstration of glycogen Best's karmin method was chiefly relied upon. Lubarsch's iodine method was only used as a control where such was deemed necessary. Many of the preparations were also examined for mucus.

Incidentally, as far as it went, the examination of the endometrium, when such was available, confirmed the observations of Ascheim regarding the cyclic changes in its glycogen content.

I found glycogen present in the epithelial cells of the mucous membrane of seven of the tubes examined. The first tube in which I found it was from a case of metritis. The cylindrical epithelial

cells lining the lumen were quite full of glycogen, which could also be seen as droplets of various sizes often clumped together so as to form an amorphous granular mass in the lumen. The muscle fibres, particularly close to the lumen, also contained a large amount of glycogen. There was no evidence of salpingitis. The epithelial cells everywhere were swollen, but in places some were observed enlarged to about four times their normal size, their protoplasm full of glycogen granules.

The next case where the tube mucous membrane was found to contain glycogen in large amount was one of extensive uterine fibromyoma complicating a five months' intrauterine pregnancy. The mucous membrane of the isthmial portion of the left tube showed a particularly rich glycogen content, also that of the ampulla on the same side. The glycogen appeared in the form of minute granules in the protoplasm of the epithelial cells, and also on their free border lying in the tube lumen. The muscle fibres of the tube wall, and to a less extent those belonging to the rather large arterioles present, also showed glycogen granules, splashes and semilunes. The polymorphonuclear leucocytes which were rather numerous in the tube wall, were also rich in glycogen. The isthmial portion of the right tube showed but little glycogen, and the ampullary portion none except a little in the muscle. The corpus luteum was present in the right ovary, and its cells were found in places to contain distinct traces of glycogen. This was the only instance in which I found glycogen in corpus luteum cells.

In a case of carcinoma of the portio vaginalis uteri the endometrium was glycogen-free, the patient having ceased to menstruate a week previous to operation. The tube mucous membrane and the muscle fibres close to the lumen of the tube, as well as the lumen itself, showed its presence in considerable quantity. The cancer cells contained glycogen here and there in the form of minute grains. Both ampullary and isthmial portions of the tube showed the glycogen.

In a case of uterine rupture at full time the mucous membrane and the muscular tissue close to the lumen of the isthmial portion of the tubes contained glycogen in considerable amount. The corpus luteum was glycogen-free.

In a case of hysterectomy for fibromyoma the glands of the endometrium were packed with glycogen, whilst the tubes were glycogen-free.

In a case of early tubal gestation, in which the plicæ in the tube contained numbers of decidua cells only a few of the latter showed mere traces of glycogen. Neither muscle fibres nor mucous membrane showed glycogen.

In a case of uterine rupture at full term decidua cells found in one of the tubes (isthmus) contained mere traces of glycogen; the

muscle fibres showed a good deal, while the epithelial cells of the mucous membrane were nearly glycogen-free.

The isthmial tubes belonging to a two months' pregnant uterus showed no trace of glycogen.

In an early case of salpingitis operated on a week after cessation of previous menstruation there was no glycogen in the tube except in the polymorphonuclear leucocytes.

In a case of carcinoma colli the endometrium contained some glands which showed considerable glycogen content, as also did the superficial epithelial cells. The majority of the glands were glycogen-free, and so was the tube.

In a case of hysterectomy for fibromyoma ten days after the cessation of the preceding menstruation the entire tube was glycogen-free.

In a case of early isthmial tubal pregnancy with rupture, the ampulla epithelium contained much glycogen. The actual site of the pregnancy was not examined. The muscle fibres were also rich in glycogen.

In a case of salpingitis with extensive infiltration of the plicæ and presence of many plasma cells, operated on four weeks after previous menstruation, there was no glycogen present except in the polymorphonuclear leucocytes.

In a case of tubal abortion and hæmatocele operated on two months after last menstruation the tube was glycogen-free.

In a case of hysterectomy for myoma a week after menstruation, the tube mucous membrane was glycogen-free, but the muscle fibres contained some.

In a case of hysterectomy for myoma about three weeks after cessation of previous menstruation, the endometrium was typically premenstrual and the glands very rich in glycogen. The tube mucous membrane contained no glycogen, the muscle fibres a little.

In a case of salpingitis with intense infiltration, glycogen was absent, except in the leucocytes, where it was plentiful.

In the tube of the fœtus at full-time I found no glycogen in any of the divisions. In the endometrium only once did I see a gland the cells of which contained a small amount of glycogen. The fœtal ovary was glycogen-free.

In carrying out this investigation I had two chief aims in view, the first being to discover whether the mucous membrane of the tube ever contained glycogen, and the second to discover whether, in the case of a positive finding regarding the presence of glycogen, the glycogen content was subject to a cyclic variation in relation to menstruation, as is the case with the endometrium. The first question I have been able to answer definitely in the affirmative, as in seven of the tubes examined glycogen was present in considerable amount in the cells of the mucous membrane. My investigation further shows

that pregnancy is not essential to the presence of the glycogen. The second question requires further investigation which I hope to be able to carry out at a later date, but my results allow me to state that undoubtedly the glycogen content of the mucous membrane of the tube undergoes considerable variations, and that, at a time when the endometrium presents all the signs of secretory activity and the epithelial cells of its glands are loaded with glycogen, the mucous membrane of the tube can be glycogen-free, and, *vice versâ*, when the endometrium is free from the glycogen, the tube mucous membrane may contain it in considerable amount. The extremely small glycogen content of the tubal decidual cells in my preparations is interesting as contrasting with the usually large content of intrauterine decidual cells. Inflammation seemed to exercise no effect in increasing the amount of glycogen present in the tubal epithelial cells. Only once did I find glycogen in the cells of the corpus luteum and even then the amount was very small.

In connection with this investigation I saw evidence that glycogen is probably not the only substance in the mucous membrane of the female genital tract which undergoes cyclic changes in relation to menstruation. In this preliminary communication I have confined myself, however, to the facts concerning glycogen and its variations.

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SELECT CLINICAL REPORTS.

(Under this heading are recorded, singly or in groups, cases to which a special interest attaches either from their unusual character or from being, in a special sense, typical examples of their class.)

Unusual Case of Hydatidiform Mole, Dealt with by Abdominal Hysterectomy.*

By J. Haig Ferguson, M.D., F.R.C.P., F.R.C.S. (Edin.).

The following case presents so many points of clinical interest, and the preparations of the uterus demonstrate so beautifully in an almost unique way some pathological points, that I venture to think it is not unworthy of your consideration this evening. All the more so that by a strange coincidence another paper follows mine dealing with another uterus containing a hydatidiform mole, in this case removed post mortem. The two cases form an interesting contrast and mutually supplement in a remarkable manner, the pathological details which Dr. Young will endeavour to demonstrate to you after the papers have been read. My own case further opens some problems as to the method of treatment, and I would welcome discussion and criticism from those present, who are so well qualified to deal with this question.

The following are the notes of the case, most of them furnished by Dr. Wilton Johns, the patient's medical attendant:—

Last December I was asked by Dr. Johns, of Nairn, to go North as soon as possible to see an urgent case with a view to operation, the patient being too ill to be removed to Edinburgh, as at one time had been intended. I set out by the first available train on a Sunday morning, and found the patient, as Dr. Johns had indicated, in a very critical and exhausted condition, and suffering from severe uterine hæmorrhage.

Mrs. C., in her 49th year, had been married for eight years, and had been previously a healthy woman and able for all her manifold duties as a farmer's wife.

Menstrual history. She began to menstruate between 17 and 18 years of age, was regular and of the 28 day type. The amount of the flow moderate (about three days' duration). Her periods were quite easy and free from pain, and never interrupted the usual routine of her life. When about 28 years of age she had complete amenorrhœa for 12 months, which was said by her doctor to be due to overwork

* Read before the Edinburgh Obstetrical Society, June 1913.

and anæmia. Apart from pregnancies this is the only interruption she has ever had in the regularity of her menstrual periods. Since then she has been well and healthy up to this illness. In childhood she had chicken-pox and measles. About the age of 18 she was very stout, afterwards she got thinner, and has been a spare, wiry woman ever since. So long as she can remember she has had a skin-rash appearing and disappearing from time to time; this rash is said to resemble psoriasis.

She has had three previous pregnancies which all terminated in abortion. The pregnancies occurred respectively when she was aged 41, 43 and 45 years. They all came to an end between the 2nd and 3rd months, with no special ascertainable reason to account for the abortions.

History of development of present illness. In September 1912 Mrs. C. missed her period; previous to that she was regular and in the enjoyment of splendid health. She also missed the October period, and at that time began to suffer from various stomach disturbances.

On November 27 she was frightened in a trap accident, and jumped hastily out of the dog-cart in which she was being driven. To this accident she herself attributes the development of her present illness. She never felt well after this occurrence and got worse every day, suffering from shortness of breath, swollen feet, distended abdomen, with more or less constant vomiting. Little things seemed to disturb her nervous and digestive systems. Bleeding from the vagina commenced on the day of the trap accident (November 27), and was practically continuous till the day of operation. The bleeding came in gushes when she was up and oozed steadily when lying in bed. When the bleeding commenced she began to think for the first time that something was wrong, and she then realized that there was a swelling in the abdomen slightly to the right of the middle line. On December 11 she got alarmed owing to the breathlessness, swollen feet and a feeling of being too weak and unfit for her work; so she sent for Dr. Johns, who found her suffering from hæmorrhage and acute dilatation of the heart. He ordered her rest and tonics. On his next visit, on careful examination in bed, he found a swelling occupying the right iliac fossa and extending to about two finger breadths below the umbilicus. The swelling at that time was hard, painless on palpation, and she complained more of a dull heavy weight than of any pain. After that the swelling seemed to increase rapidly in size. She developed symptoms of obstruction of the bowels, and there was alarming dyspnœa, the hæmorrhage going on all the time.

The urine was apparently normal in quantity, and with no albumen, but was loaded with urates. The breasts were distinctly enlarged.

When I saw her on December 22 she was in a very critical condition, exsanguine and exhausted with that peculiarly drawn and anxious facial expression common to desperate cases. On examination there was a hard, slightly tender swelling in the abdomen somewhat to the right of the middle line, and reaching up a little above the umbilicus. On vaginal examination it proved to be undoubtedly a uterine tumour associated with pregnancy, although its exact nature was uncertain. The cervix was hard and cartilaginous in consistence, and the external os was so small that not even the point of a uterine sound could find entrance. There was a group of small fibroids to be felt encircling the lower uterine segment, and the bleeding was profuse during the examination.

Abdominally variations in consistence due to contractions and relaxations of the swelling could be made out. There was some irregularity in outline, but no fœtal parts could be discovered. There were no fœtal heart sounds, nor was there a uterine souffle to be heard. There was some free fluid in the abdomen.

I came to the conclusion that the condition was either a fibroid uterus complicated by pregnancy, placenta prævia with fibroids in the lower uterine segment, or a hydatidiform mole. No vesicles or suspicious discharge had come away.

Here then one was face to face with a woman in a most exhausted state from hæmorrhage and manifestly dying unless prompt measures could be taken. And here is the point where the treatment I adopted may come in for criticism. The patient was in a lonely farmhouse, six miles at least from the county town and hospital, with no appliances and no nurses at hand. We decided to take her at once by motor to the Cottage Hospital, and there carry out the necessary treatment. In view of the uncertainty of the diagnosis, and the danger which would attend forcible dilatation of a rigid cervix in a patient manifestly unable to bear any long and tedious operation, I was averse to this form of vaginal interference. I considered the question of vaginal hysterotomy and evacuation of the uterus, keeping in view the possibility of a hydatidiform mass in a fibroid uterus, and the presence of the free fluid in the abdomen possibly indicating uterine erosion; also that the patient was 49 years of age and would have no further use for her uterus. The uterus if left in such circumstances might prove a positive source of danger to her if it were maimed and eroded, not to speak of the remoter risk of chorionepithelioma. In consideration of all this I decided against the vaginal route, and determined to open the abdomen.

Dr. Lees skilfully anæsthetized the patient, and with Dr. Johns' kind assistance and that of the capable nursing staff in the Nairn Cottage Hospital, I operated rapidly, removing the uterus by supra-vaginal hysterectomy, and the patient was back in bed in little

over half an hour. There were about two quarts of free fluid in the abdomen. The ovaries were not interfered with.

The patient made a rapid and uneventful recovery, and when last I heard she had resumed her active life, and feels as if she had been resurrected.

Hysterectomy, of course, is not the orthodox or routine method of treatment for hydatidiform mole, but I submit that in the circumstances it was the best course—probably the only course which would have saved this patient's life. I can only find four other cases where a uterus containing a hydatidiform mole was removed by abdominal section. The *first* is recorded in our *Transactions* by Christopher Martin in 1896; *another* by Favell of Sheffield (*North of England Obstet. and Gynæcol. Trans.*, 1907), a drawing of which, by the kindness of Dr. Fothergill, I now show you; a *third* by Sauvage in the *Annales d'Obst. et de Gynécologie* for last April; and a *fourth* operated on no later than last Saturday at St. Mary's Hospital, Manchester, by Dr. Fothergill, who tells me that in this case there was enormous distension by hydroperitoneum without obvious cause.

Two other points of interest are: first, the age of the patient—49—in relation to the incidence of hydatidiform mole; and, secondly, the presence of so much free fluid in the abdomen without any evidence in the specimen (as in Fothergill's case) of complete uterine erosion or perforation.

The fluid was not blood-stained in my case, and it may possibly have been the result of the cardiac weakness, though in that case one would have expected to find some albumen in the urine. On the other hand, it is just possible it might arise from exudation through the uterine wall, as the uterus itself was distinctly œdematous.

Rattray, in vol. i of our *Transactions*, 1869, records a case of hydatidiform mole in a woman of 50, and Kehrer and Bloch give the following interesting tables of a series of cases showing the age of incidence of these moles:—

Kehrer, "Uber Traubenmolen," *Archiv f. Gynäk.*, 1894, xlv, 486:

2 cases, *i.e.*, 4 per cent., before 20.
19 cases, *i.e.*, 38 per cent., between 21 and 30.
18 cases, *i.e.*, 36 per cent., between 31 and 40.
9 cases, *i.e.*, 18 per cent., between 41 and 50.
2 cases, *i.e.*, 4 per cent., in 52nd and 53rd year.

50 cases.

Kehrer reports Bloch in his paper:—

15 cases between 20 and 30.
20 cases between 30 and 40.
14 cases between 40 and 50.

Kehrer's figures of incidence of mole after 40=22 per cent.
Bloch's figures of incidence of mole after 40=28·5 per cent.

I would like to express my appreciation of the artist's skill in reproducing my specimen, and of the exceptionally beautiful sections which have been cut and mounted by Mr. Tom Hamilton in the Royal College of Physicians Laboratory.

Description of Specimen by Dr. James Young:—

In the *fresh state* the uterus was enlarged to the size of a six months' pregnancy. The enlargement was uniform, and except that it was of firm consistence throughout, in appearance it suggested the pregnant state. It was removed at the level of the isthmus. From the uterine canal several hydatid vesicles were projecting, with some blood-clot.

After hardening in formalin the uterus was cut in the sagittal mesial line, when the remarkable demonstration of a hydatid mole *in situ* represented in Plate I was seen. The uterus is uniformly expanded by the mole, the wall being about one-third of an inch thick throughout. The vesicles are of greatly varying size, some being as large as half an inch in diameter. They are closely packed together in a matrix of blood. Round the greater part of the surface the vesicles lie close up against the uterine wall. At no place is there any evidence of extensive erosion, though in one of the sections one of the villi is seen to lie in a small bay excavated in the uterine wall. Round the rest of the surface the muscular coat presents a gently undulating appearance, the shallow depressions thus produced being occupied by the expanded villi. It is remarkable that there is no more evidence than there is of an erosion process, and it is interesting to see that the destruction of uterine tissue has been almost uniform throughout. There is in no place, either in section or on the peritoneal surface, any evidence of perforation of the uterine wall. From the point of view of the naked eye appearances the condition corresponds to a benign invasion. On the back of the uterus low down there is a small fibroid.

At the anterior aspect of the section there is an elongate space, $2\frac{1}{2}$ inches in length, which is occupied by blood-clot. At this region the mole is separated by the blood space from the muscular wall. The naked eye appearances suggest that this is the uterine cavity. Over the surface of the mole in this region there is seen a thin layer of tissue which at either end is attached to the wall of the uterus. If the blood be in the uterine cavity this will correspond to the reflexa (Plate I and II).

The naked eye relations are well brought out in the thin section obtained by imbedding and cutting a slice of the complete uterus in celloidin (Plate II).

Hydatid Mole *in utero*. Shows expanded villi lying in fluid blood. To the left the uterine cavity is seen filled with blood-clot. Small fibroids are seen in the lower part of the muscular wall.

Mrgll

Plate II.

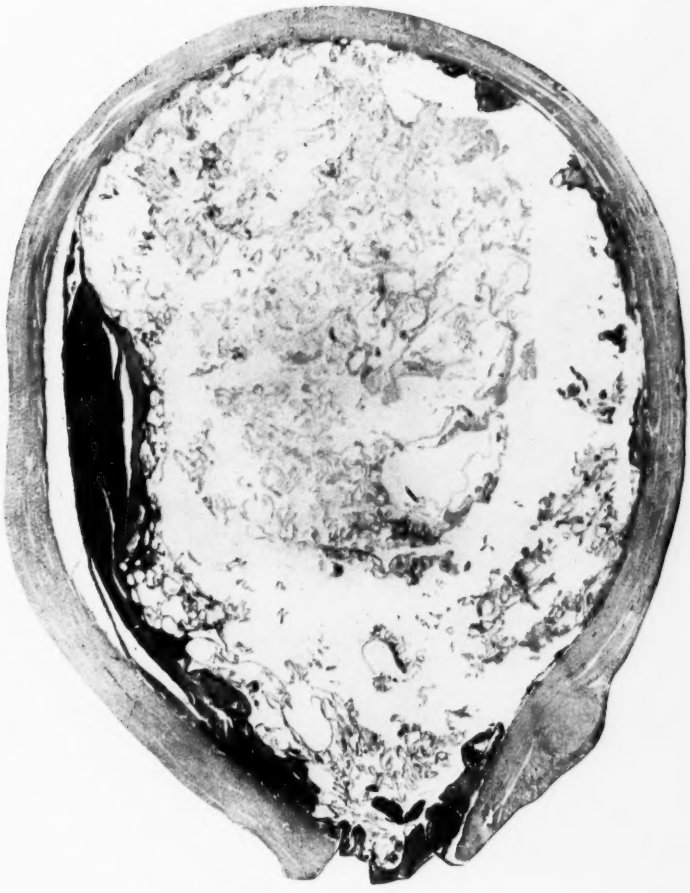

Plate III.

In upper part a hydatid villus is seen showing marked epithelial proliferation. Under this is the degenerated uterine wall.

Microscopic appearances. In all the regions of attachment of villi to uterus the ordinary appearances associated with a chorionic invasion are seen. There is a necrotic layer of tissue permeated with blood. There is in places a well-marked decidua. The vessels are greatly expanded in the decidua and throughout the muscular coat and everywhere the tissues are œdematous (Plate III).

In the region corresponding to the uterine cavity the mole is seen to be covered by the fine layer already referred to. This is seen microscopically to consist of fibrinous tissue. On the further side of the blood-clot in this region, *i.e.*, on the uterine wall corresponding to the mucosa lining the cavity there is a well-marked decidua—the decidua vera.

The microscopic investigation confirms the naked eye appearances in demonstrating the absence of any invasion of the uterine muscle of a malignant nature.

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Fothergill (Manchester), 1913. (Case not yet published).
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Fatal Case of Hydatidiform Mole.

By J. W. Ballantyne, M.D., F.R.C.P, and
James Young, M.D., F.R.C.S.

On July 27 1912 Mrs. M. was brought in a motor-car to the Royal Maternity Hospital, Edinburgh, she was suffering from hæmorrhage, and was obviously in a dying condition. She was pulseless, cold, exsanguine, and had gasping respiration. Ether, strychnine and brandy were given hypodermically, and a submammary infusion of saline solution was administered, but the pulse never returned and she was dead five minutes after admission (before the giving of the saline was completed).

She was 47 years of age; she had had thirteen children, who were all healthy; the eldest was 29 years old and the youngest 15 months. She was motored to the Hospital by her eldest son. On the preceding day (July 26) she felt cramp-like pains all over the abdomen, and in the afternoon a severe hæmorrhage came on. Her doctor was sent for, and he, on his arrival, cleared out the vaginal canal which was full of clots. The bleeding then stopped for a time, but her friends stated that there was oozing during the night. Hæmorrhage returned on the morning of July 27, when the doctor was again in attendance. He diagnosed the case as one of placenta prævia, packed the vagina with some cotton wool pledgets, and sent her into Edinburgh by motor, a distance of nearly twenty miles. As has been stated above, she was moribund before arrival at the Hospital.

There was time, however, before she ceased to breathe, to make a rapid examination, when it was found that the uterus was the size of a seven months' pregnancy, reaching as it did to a little above the umbilicus. But her history told only of a three months' pregnancy. The vagina contained some cotton wool pledgets and blood-clot. Protruding from the cervical canal was a fleshy mass, which was of a friable nature. Some watery vesicles broke away from it when it was handled, and these enabled the house surgeon (Dr. Grant) at once to make the diagnosis of hydatid mole in the uterus. This, of course, accounted for the discrepancy between the size of the uterus and the supposed age of the pregnancy (three months). Her admission and death took place at 9-45 p.m.

At the necropsy made on the forenoon of July 28, the body was found to be well-nourished and there was a large amount of fat in the anterior abdominal wall. The uterus was enlarged, reaching to above the level of the umbilicus; and in one of the ovaries there

Fig. 1. Hydatid mole in utero. The uterine cavity is seen above. Note thinning of uterine wall. The cervix is expanded to diameter of 1 inch.

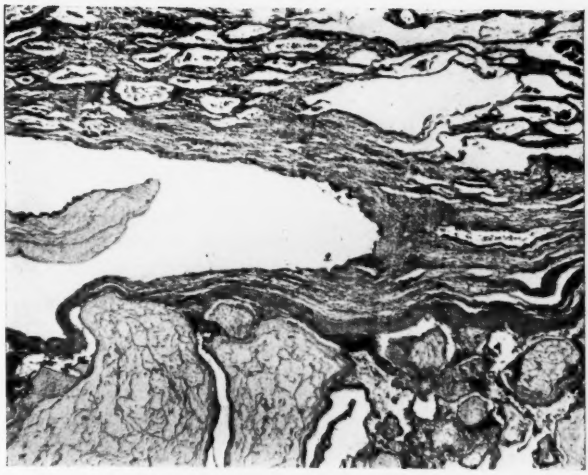

Fig. 2.

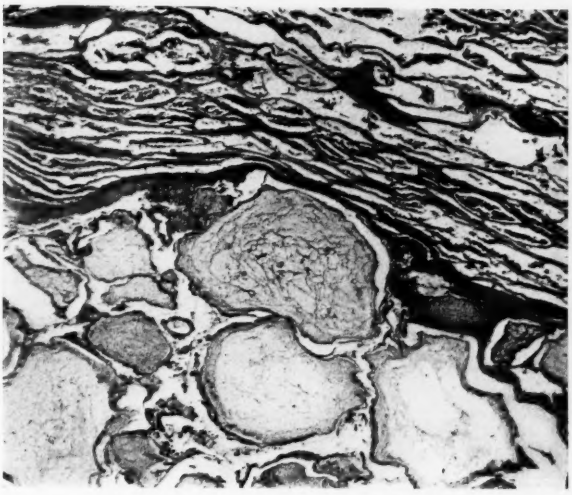

Fig. 3.

was a lutein cyst the size of a bean. The liver showed cloudy swelling, but the kidneys were quite normal. The appearances of the other organs were such as are found in cases of death from hæmorrhage. The uterus was removed intact from the abdomen and was placed in preserving fluid for subsequent examination.

J. W. B.

Description of Pathology.

The specimen consists of the uterus, tubes and ovaries and upper portion of vagina, with bladder and rectum attached. It was hardened in formalin, and the uterus and vagina were cut vertically along the mesial sagittal plane (Fig. 1).

The uterus, after hardening, is $7\frac{1}{2}$ ins. long, and its maximum antero-posterior diameter is 6 ins. The enlargement is due to the mass of villi of varying size; some are as large as $\frac{3}{4}$ in. in diameter. The majority are small; in fact it is interesting to note that a great part of the mass consists of villous tufts, in which there is no observable vesicular degeneration. Here and there small quantities of blood-clot are present, but, throughout, the mass is almost blood-free. This is accounted for by the fact that, in the intervillous space, the blood had remained fluid and diffused or was dissolved away in the fixing solution. The same was true of Dr. Haig Ferguson's specimen. This is an important finding from the clinical aspect, for it accounts for the copious bleeding which occurs in these cases. As in a normal pregnancy, so here, contact with the villi maintains the blood in the intervillous space in a fluid condition. Once rupture into the uterine or cervical canal occurs the blood may leak away without there being any attempt at natural arrest.

There is no evidence of a fœtus.

The cervical canal, though unoccupied by any of the villous mass, is expanded. The external os is one inch in diameter.

The uterine wall is thinned throughout the entire extent of the body, especially in front and behind. The maximum thickness is $\frac{3}{8}$ in. In parts it is only $\frac{1}{8}$ in. The internal surface of the wall is ragged and eroded. This is well shown on the anterior (left) wall in the plate. In places the hydatid mass has become detached from the wall of the uterus, doubtless in the process of hardening and handling. In other places the attachment is still firm. Portions from these regions were removed for microscopic investigation.

At the summit of the mole there is an elongated space $3\frac{1}{4}$ ins. long occupied by firm blood-clot (Fig. 1). In this region there is a distinct interval between mole and muscle, and the latter lacks the ragged, worm-eaten appearance, which it possesses round the rest of the uterine wall. On careful examination a thin membrane can be detected covering the mole in this region and separating it from the blood-clot. At each end this membrane becomes continuous with the uterine wall, from which it is reflected. In point of fact this

membrane corresponds to the *decidua reflexa* and the space overlying it is the cavity of the uterus filled with blood-clot. This will be confirmed when the microscopic appearances are described. In other words, we see that the mole is growing in the uterine mucous membrane, in which it is embedded. In this way the condition here corresponds with that present in the development of a healthy ovum. It is possible that the fusion between decidua reflexa and decidua vera, which normally is said to occur when the ovum reaches the size corresponding to the 3rd or 4th month, has, in this case, been prevented by the collection of blood in the uterine cavity.

It should be stated that the cavity of the uterus would doubtless be found to extend for some distance in a downward direction in one or other of the hemisected portions of the uterus. No endeavour was made to trace its extent, as this would have meant detachment of the mole.

At its lower pole the mole is bare and teased out. It is not covered by any membrane as in its upper part, and its exposed surface projects into the expanding cervix. From this surface the fatal hæmorrhage had taken place.

Microscopic sections from the neighbourhood of the reflection of the decidua reflexa exhibit the appearances shown in Fig. 2. Below, the expanded villi are seen, separated from the cavity by the decidual membrane. This is seen springing from the uterine wall, and is seen to become continuous laterally with the decidua vera, which lines the cavity above. In the sections the decidua reflexa is complete, though in places, as seen in the figure, it has become extremely thin. As one would expect, it becomes thinner as it is traced inwards from the point of reflection from the uterine wall.

In the figure the expanded glands in the decidua vera are well seen. A decidual reaction is well marked in the vera, and also in the reflexa.

In most places the villi are separated from the muscular coat by a distinct layer of mucosa. In no place has there been an invasion of the muscular coat, though here and there only a thin sheet of mucous membrane intervenes. In Fig. 3 is seen the *decidua serotina* with expanded glands separating the mole from the muscular coat of the uterus.

Throughout, the mucous membrane is œdematous, the vessels are expanded and there is a free leakage of blood.

Round the periphery of the mole, where the villi abut on the mucosa, there is a layer of darkly-staining, necrotic tissue. Beyond this again the maternal tissues are degenerated, the destructive process becoming more and more evident the nearer the tissue is to the villi. Where there is only a thin layer of mucosa intervening between villi and muscle the latter exhibits the necrotic change. The degenerative changes in mucosa and muscle are obviously due

to the action of some chemical substance or secretion emanating from the chorionic cells. They coincide with the appearances which are known to occur in other regions of chorionic activity. This is responsible not only for the degenerative changes but is the active agent in leading to the suffusing of the maternal tissues in the proximity of the villi with the blood fluid and cells. In this specimen the preservation is not sufficiently good to allow of an elaborate study of the finer histological features. The specimen was obtained in the post mortem room and exhibits the well-known readiness with which autolytic changes affect the uterine mucous membrane.

The *mole* exhibits the usual naked-eye appearances. The villi vary in size from cysts easily seen with the naked eye (some, as has been said, are as large as $\frac{3}{4}$ in. across) to villi, in which there has been little or no alteration. The connective-tissue core of the villi is œdematous and consists of cells united by long branching processes. In the larger villi the conective-tissue has been pressed to the surface as a fine layer by the fluid accumulating in the centre. In places the tips of the villi are engrafted on to the mucous membrane.

The epithelial covering of the villi exhibits the two well-known layers, the Langhans' cells and the syncytium. In many places there is a definite hyperplasia of the epithelium. This takes the form of a heaping-up of the Langhans' and syncytial layer on the surface of the villi. So marked is this that large solid masses of the epithelium are scattered about abundantly in the intervillous space. In fact, the proliferative process is so well developed in the specimens as to suggest that it constitutes an essential feature in the formation of the mole. A similar hyperplasia of the chorionic epithelium has been described by Marchand and others. It means that a hydatid mole is not a mere collection of villi, which for some reason or other have departed from the normal state by undergoing an œdematous expansion. It is a true proliferative or tumour formation, in which the essential proliferating element, the villus, has undergone an œdematous change.

The chorionic cells are usually recognized to possess the faculty of actively transmitting across the villous surface the fluid and solid elements necessary for the growing embryo. Under normal circumstances these are conveyed to the fœtal circulation by the chorionic vessels as soon as they enter the villus. Where there are no such efferent channels, as in death or absence of the embryo, it is conceivable that the fluid would accumulate in and expand the villi. But the fact that the degeneration may, in twin pregnancy, be limited to the chorionic surface of one of the fœtuses, the other escaping, and the presence of a definitely abnormal proliferative change in the chorion, which may later evidence itself as a malignant process (chorionepithelioma), both suggest that the cause of the molar change

is to be traced to the chorion itself. If such be the case the vesicular degeneration of the villi would be no more the essential feature in this condition than is the cystic degeneration the essential feature in a case of cystic adenoma. In both cases the classification of the disease is in terms of the epithelial new growth. As in an adenoma there is an incidental increase in the supporting connective-tissue, so in an epithelial proliferation of the chorion there is a concomitant increase in the connective-tissue of the villi. When the epithelial overgrowth assumes definitely malignant characters, however, as in chorionepithelioma, the conective-tissue does not share in the hyperplasia.

The ovaries. These exhibit a multiple cystic change similar to that frequently described in the ovary in association with hydatidiform degeneration of the chorion and chorionepithelioma. The cysts are for the most part small. On microscopic examination they are seen to be lined with a layer of luteal tissue. The ovarian stroma is œdematous and exhibits scattered hæmorrhages.

J. Y.

Obituary.

JAMES HENRY TARGETT, M.S., F.R.C.S.,

Obstetric Surgeon, Guy's Hospital.

James Henry Targett, whose early death at the age of 51 took place on May 27, was born in Wiltshire. For two years he went to the Grammar School at Warminster, but, owing to delicate health, his education was continued with a private tutor at Salisbury. He entered Guy's Hospital as a student in October 1878. Obtaining honours in anatomy and chemistry at the first M.B. in 1881, he took the M.B. (Lond.) with honours in forensic medicine in 1883, and in the same year was awarded the Mackenzie Bacon and Gurney Hoare prizes at his hospital. He took the B.S. with honours in 1885 and was appointed surgical registrar, a post he held for two years. He obtained the diploma of F.R.C.S. (Eng.) in 1886, and the M.S. in 1887. In the same year he became assistant curator to the museum at Guy's Hospital, this being followed by appointments as demonstrator of anatomy in 1889 and as demonstrator of surgical pathology and morbid histology in 1895. In 1897 he became obstetric registrar and tutor, and assistant obstetric physician the year following. In 1903, on the retirement of Dr. Galabin, he became obstetric physician, the title of the post being changed to that of obstetric surgeon, and he became the senior in the department on the death of Dr. Horrocks.

During the earlier years of his connection with Guy's Hospital he was doing much work elsewhere. All through his career he had a strong bent towards pathological anatomy, and in this subject he became deservedly a recognized authority. Following on his curatorship at Guy's Hospital, he was appointed pathological assistant to the museum of the Royal College of Surgeons in January 1888, Sir Frederic Eve being at that time curator. He succeeded to the post of curator in 1890, and held it till 1897. He is remembered as an able and energetic curator who added many specimens to the museum. He edited the appendices to the descriptive catalogue of the museum from 1891 to 1897, and gave the Erasmus Wilson lectures on pathology in 1893 and the two following years. During this period he contributed twenty-six papers to the *Transactions* of the Pathological Society, of which he was secretary in 1895 and 1896. He also held appointments as assistant surgeon at the Evelina Hospital and later as surgeon to out-patients at the Samaritan Free Hospital.

Following on these years devoted largely to pathological work, came the time when his energies were absorbed mainly in his clinical

work as an obstetric surgeon. As early as 1891 he was elected a fellow of the Obstetrical Society, and whilst he made a few contributions to the Society, it was not till about the year 1897, when he became obstetric registrar at Guy's Hospital and resigned the curatorship at the Royal College of Surgeons, that he devoted himself more particularly to clinical work. And here the interest in and devotion to his work that characterized him throughout earned, for him before very long a recognized and honoured position. He continued to contribute papers largely of a pathological nature to the medical journals and the Society's *Transactions*, and in 1910 and 1911 was secretary to the Obstetrical Society.

As a writer of reports, whether clinical or pathological, he was probably unequalled. He wrote apparently with great ease and could in a few words give a clear picture of any specimen he had to describe. He was delicate as a youth, and probably at no time enjoyed robust health, but where his work was concerned he never spared himself. He had that restless energy often found in those of frail constitution. Partly no doubt owing to this, he had no outside pursuits, and the energies that most men devote in part to these were by him given up entirely to his work.

He was the best and kindest of colleagues. Incapable himself of giving offence, he was slow to take umbrage at anything said or done by others. No man had a more honourable and upright standard of life always before him. In 1911 he was laid up for a long time with an appendical abscess, and the sad loss of his only boy in the same year was a great blow to him and undoubtedly affected his health. The illness which terminated fatally was of long duration. He was taken ill in September 1912 with ulcerative endocarditis, and it was not till Tuesday, May 27 1913, that the end came.

REVIEWS OF CURRENT LITERATURE.

UNDER CHARGE OF EARDLEY HOLLAND, M.D.

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DUNDEE. J. A. C. Kynoch, M.B.
CHELTENHAM. C. J. N. Longridge, M.D.

Acromegaly: Ovarian treatment: Pregnancy.

KALLEDEY (*Zentralbl. f. Gynäk.*, No. 28, 1913) has under his observation a woman, aged 32, subject to symptoms of acromegaly for four years with suspension of the reproductive functions, which has been overcome by administration of ovarian extract. The patient's family history is good and she enjoyed good health in childhood. The periods appeared at the age of 17, and were always scanty but hardly painful. She married at twenty and two years later the catamenial function ceased entirely; there had been no signs of pregnancy. When about twenty-eight, ataxic symptoms and enlargement of the feet developed, by that time she had grown very fat, indeed corpulence was noted soon after the amenorrhœa was established. Then the patient became subject to bad headaches, sleeplessness, and vertigo, with palpitations and syncope. At length she was unable to walk out alone. Kalledey first saw her last December in Bársony's clinique at Buda-Pesth. She was then extremely fat and the long bones were palpably enlarged. The breasts were big, through fat, and not through over development of glandular tissue. The patient's appearance was masculine, and she shaved, as a strong beard grew on her chin. The lips and nose were thickened. There was considerable ataxy and an attack of syncope occurred though there was no evidence of cardiac disease. No sign of disease of the base of the skull could be defined by use of the *x*-rays. The urine did not contain sugar. The abdomen was so fat that the body of the uterus could not be defined, the cervix was small and conical, and the vulva pale but the pudenda was very hirsute. After thinking on what is known about hormones and opotherapy, Kalledey treated the patient with intra-venous injections of ovarian extract. The watery solution which he used held a gramme of ovarian extract, from the cow, to the cubic centimetre. On December 2, after six injections, three times weekly, the patient declared that the ataxy, headaches, and fainting

fits were passing off. After the sixteenth injection she was able to walk about alone, and she left the hospital to attend to home business. Kalledey directed her to take three tablets of ovarian extract daily. She obeyed his advice and on January 22, 1913, slight uterine hæmorrhage occurred with distinct molimen. On February 20 a show of blood appeared and lasted for six days. At the same time the patient found it necessary to wear smaller shoes and to "take in" her clothes as the feet were becoming smaller and the corpulence was subsiding. On March 2 and 5 Kalledey gave an intra-venous injection of the extract. For a fortnight later she had a feverish attack which her family doctor considered to be influenza. No extract or intra-venous injections were administered. On March 30 the patient visited the clinique, and stated that the periods had not appeared. As the interpretation of that fact was open to sources of fallacy, she was carefully examined by Professor Bársony. He and Kalledey noted that the vulva which had been distinctly pale, had become livid and the portio was soft and the body of the uterus enlarged and softened. Thus it seemed as though the amenorrhœa was not due to the discontinuance of the extract, and its administration was not resumed. A month later all the evidences of pregnancy were discovered and on May 23, when the patient was last examined before Kalledey's report was published, gestation was proceeding favourably. The author promises to report the further history of this case.

A.D.

Echinococcus of pelvis.

Fekete (*Zentralbl. f. Gynäk.*, No. 28, 1913) recently reported before a Society at Buda-Pesth a case where a woman, aged 22, had been in ill-health ever since her last confinement, eighteen months before she came under observation. She was a workman's wife but no evidence of any source of infection was to be found. The body of the uterus was anteflexed and on its right was a highly lobulated, or rather a racemose tumour, extending backwards, and simulating a malignant ovarian growth. Abdominal section was performed and the tumour removed without difficulty. On examining the uterus, however, some hydatid cysts in the wall burst. The daughter-cysts could not be enucleated from the uterine tissues, so a Doyen's panhysterectomy was performed, with success. A.D.

Prolapse of the vaginal walls and incontinence of urine.

Muret (*Revue de Gyn. et de Chirug. Abdom.*, April and May 1913) has tried to throw light on the question why some patients with prolapse get incontinence of urine in a more or less marked degree, while others are not worried in this way at all. He concludes that the relation of the anterior and posterior walls of the urethra is the important point in determining the presence of incontinence. If they remain parallel to each other there is no incontinence however great the prolapse, whereas, in a slight case, if the posterior urethral wall is dragged down away from the anterior so that the urethra becomes funnel-shaped, incontinence of urine will be present.

Clinically, it should be noticed if the swelling in the anterior vaginal wall comes down as far as the urinary meatus—if it does the urethral walls will not be in apposition with each other [unless the whole urethra has become separated from its pubic attachments]. In such cases digital pressure on the swelling, about an inch from the meatus, may stop incontinence while the patient strains, and these patients will get benefit from a pessary which keeps the posterior urethral wall in contact with the anterior.

An anterior colporrhaphy will give relief if taken well down to the meatus. The author advises stitching it up so that the stitches are T. shaped—the horizontal limb of the T. being just above the meatus.

Several illustrative cases are mentioned. C.W.

Pedunculated thrombus of the vagina.

Potocki and Sauvage (*Bulletin de la Société d'Obstétrique et de Gynécologie de Paris, etc.*, No. 4, April 1913) describe in detail two examples of this condition and discuss the histological appearances of the thrombus and adjacent tissues. They divide vaginal thrombi into two classes, viz.: (*a*) the simple pedunculated thrombus and (*b*) the varicose pedunculated thrombus. In the first class the clot is usually covered with the vaginal stratified epithelium but the cells show perinuclear vacuolation and numerous karyokinetic figures in the nuclei. The corium is œdematous and presents a slight degree of leucocytic infiltration, tumefaction of the capillary endothelium, and an extensive fibrinous network. In the adjoining sub-mucous layer the tissues are œdematous and the leucocytic infiltration more pronounced. Numerous small hæmorrhages are present, with recent thrombosis in both veins and arteries. The thrombi are in process of organisation and the older areas show new-formed capillaries. In the varicose pedunculated thrombi, on the other hand, the mucous membrane is absent over a large area of the surface and replaced by a false capsule composed of fibrin and disintegrated leucocytes. The underlying tissue presents inflammatory lesions and is studded with large irregular blood spaces especially near the surface. The hæmorrhage and leucocytic reaction is much more acute than in the simple thrombus but the œdema is less marked. The blood spaces are produced partly by diffuse hæmorrhages and partly by enormous distension of veins. The arteries are normal but the veins as a rule are thrombosed.

From an analysis of 21 cases recorded in the literature the writers note that in all the thrombus appeared during the second half of pregnancy. Thirteen cases occurred in primiparæ, four in secundiparæ, and one in a tertipara. The position of the lesion is always the same, viz., at the lower part of the posterior median column of the vagina, about three centimètres from the posterior commissure of the vulva.

Funck-Bretano attempts to explain this fact, by considering that the thrombus is the result of local trauma produced by muscular tension at the anal bend during defæcation. The thrombus always presents the same appearance and shape. It is a pedunculated tumour, black, and bleeding, with necrotic areas on the surface. It frequently co-exists with vulval varix. Thus in three cases only amongst the published records was this condition of varix absent. The thrombus frequently disappears spontaneously during the pregnancy either from absorption or as a result of expulsion. In no case has it ever led to marked difficulty during labour. The ideal treatment is ablation of the tumour, although there is no evidence to prove that an expectant treatment has ever led to any ulterior result.

H.B.W.

Myomata.

R. Schindler (*Gynækol. Rundschau*, 1913, Ht. 12). A critical review of the literature of 1911. The author notes the advances made regarding etiology, and the effect on the rest of the body, especially on the circulatory system. The various operative procedures are discussed and their results compared. R.M.A.

The pathology of chorion-epithelioma.

PROUST and BENDER (*Revue de Gyn. et de Chirug. Abdom.*, April and May 1913) have an excellent monograph on this subject.

They discuss the structure and development of the normal villus and then go into the question of the occurrence of placental tissue in the maternal blood. The history of the earlier described cases of "deciduoma malignum" is given in some detail and the references to the literature are added.

The pathological anatomy, both gross and microscopic, is gone into in detail and the literature has been searched to give the relative frequency of metastatic deposits in different organs.

In discussing diagnosis they divide the subjects into three: (*a*) after normal pregnancy, (*b*) after placental polypus, (*c*) after hydatidiform mole. They admit that the histology of a hydatidiform mole is of very little use in forming a prognosis as to its malignancy.

Chorion-epithelioma of the Fallopian tube is mentioned and short accounts of the recorded cases given.

A separate chapter is given to cases in which these growths are supposed to have originated in teratomata—some of these they accept, although they admit that portions of ordinary sarcomata may be strikingly like chorion-epitheliomata.

The article is a valuable one and represents an immense amount of work, the references to the literature should be specially valuable to anyone wishing to look up the subject. C.W.

The clinical aspects of chorion-epithelioma.

POLLOSSON and VIOLET (*Revue de Gyn. et de Chirug. Abdom.*, April and May 1913) have contributed a careful review on this subject, its value is somewhat diminished by the absence of references—many writers' names are given but there is no indication as to where their writings can be found.

Interesting statistics are given as to the comparative frequency of the growth with varying degrees of multiparity and an analysis of 455 cases shows the following antecedents:—

Hydatidiform mole	203
Abortion	135
Full term labour	99
Tubal gestation	12
Doubtful	6
	455

They find the extreme ages at which it has occurred to be seventeen years and fifty-five years; but the majority are found between twenty-five and thirty-five years.

They quote Sénarclens, who followed up the after-histories of 49 molar pregnancies, and found chorion-epithelioma to have followed in 6 per cent.

As clinical types of the disease they mention first cases where the symptoms of the growth follow immediately on the passage of a mole; secondly, the so-called recurrent placental polypus; thirdly, what is taken to be a glandular carcinoma occurring in a young woman; fourthly, where vulval or vaginal metastases are first noticed; and lastly, the acute form with infection which is mistaken for puerperal septicæmia.

They then go into the question of tubal growths and give abstracts of them. They have collected 14 cases but do not mention one by Garkisch which Proust and Bender mention in their article in the same publication. Their references to the orginal articles are also not as complete as those of Proust and Bender.

The article then goes on with the discussion of the prognosis and the spontaneous cures which have been reported are mentioned.

Statistics are given showing that the results of hysterectomy performed for chorion-epithelioma are better when the growth follows a hydatidiform mole than when it comes after a normal labour. In performing hysterectomy the question arises whether the ovaries should or should not be removed. Very frequently they are the seat of cysts (often lutein) and these are usually removed, but if the ovaries are normal and the patient young it is a more difficult point to decide. The authors seem, on the whole, to be in favour of leaving them in young patients, although they admit that they have been proved to be the seat of metastatic infection in some cases. C.W.

Intersexual blood reactions in the horse.

Le Lorier, Paris, resumes his observations (*Arch. Mens. d'Obstét. et de Gynécol.*, April 1913) on the effects of male albuminous substances on the female organism. In the same journal last year he suggested that in the intoxications of pregnancy it was difficult to understand how the maternal cells could intoxicate the maternal organism and that the poisoning must accordingly arise from the paternal cells in the ovum. In support of this hypothesis he showed that man's serum agglutinates the corpuscles in man's or woman's blood three times more frequently than does woman's serum. On the other hand, the lower animals never suffer from intoxications of pregnancy, and Le Lorier now gives the results of his researches with horse blood.

The agglutination is never so marked as in human blood but it occurs in a modified way in 24 per cent. of horse blood in general with serum of an entire horse, in 37 per cent. with mare's serum, and in 27 per cent. with serum of a castrated horse : in general terms a man's corpuscles seem more agglutinable than those of male horses (entire or not).

Percentage Table.

	Entire.	Mare.	Castrated horse.	Means.
Entire's serum	24	26	21·5	23
Mare's serum	33·3	44	36	37
Gelding's serum	26	32	24	27
Means	27	34	27	—

E.H.L.O.

Modification in the fat and cholesterin of the blood during pregnancy and the puerperium.

Decio (*Annali di Ostetricia*, March 1913) publishes results of investigations of certain modifications in the blood during pregnancy and the puerperium, pathologic or physiologic. The number of cases examined was 53, the methods employed those of Kumagawa, Suto, and Windhaus. It was found that the amount of fatty acids and cholesterin gradually increases during pregnancy, reaching a maximum at term when it is on an

average twice as great as in the blood of non-pregnant women. The origin of this increase is two-fold, being due to lessened oxidation of organic fats during the period of gestation and to greater absorption and utilisation of intestinal fat. Lipoids, properly so-called, and cholesterin are due to an exalted fat-producing activity of the glands of internal secretion, especially of the suprarenal capsules and the corpus luteum. In pathologic conditions, especially in eclampsia, where a very high percentage of fatty acids is found in the circulation, it is probable that the placenta and the liver are additional sources of origin. The accumulation of fats and cholesterin seems destined both for maternal and fœtal needs, and the increase of cholesterin must be interpreted as the sign of a defensive reaction of the organism against toxins present even in physiologic pregnancies. Given the great importance of lipoids, both physiologically and pathologically, it is probable that many morbid manifestations during pregnancy are allied to the altered content of the blood, though in others, such as puerperal bradycardia, no such causal relation can be traced. Y.H.

Concerning the rôle of the corpus luteum in the embedding and development of the ovum in the human female.

Puech and Vanverts (*Revue Mens. de Gyn., d'Obst., et de Ped.*, April 1913). The elder Born was the first to propose that the corpus luteum should be regarded as a gland with an internal secretion which aided in the embedding and subsequent development of the fertilised ovum.

This suggestion has been verified experimentally by Magnus, Cohn and Fraenkel. The latter, by his experiments on rabbits in which he completely destroyed the corpus luteum and the two ovaries, demonstrated that (1) ablation of the corpus luteum prevented pregnancy, (2) it also caused the absorption and disappearance of the ovum in the early months of pregnancy, (3) that this action is most profound during the early months and later it is not present.

These statements are admitted by most critics, and Weymeersch has shown that suppression of the corpus luteum is followed immediately by a constriction of the uterine vessels and by uterine contractions which prevent full circulation of blood through the organ.

The question is whether these experimental findings are applicable to the human female. It is a very difficult point to settle, for in the case of a bilateral ovariotomy following on a coitus in which fertilisation of an ovum has occurred, and the ovum has not arrived in the uterus, the state of affairs is not known to the observer. There is no sign to guide him that impregnation has occurred. However, with regard to the question as to the rôle played in the subsequent development of an implanted ovum, an examination of the known facts yields some interesting results.

Using the statistics of Cathala, with some others, relative to ovariotomies in the early months of pregnancy, the following data are arrived at. In the majority of cases where the corpus luteum has been removed by a double ovariotomy or by an ovariotomy of the ovary containing it in the early months, the pregnancy has been uninterrupted. Further, Cathala points out that in those cases which aborted, the women, in some of them, had previously been the subjects of two or three abortions. On these grounds Cathala concludes that the corpus luteum is not indispensable to the nutrition of the ovum and that its removal in the early months is not able to be considered as a cause of abortion.

The writers of this paper, though agreeing that the statement is correct

to a certain extent, believe it to be too positive. In support of this they put forward the following facts: (1) that abortion is more frequent during the first two months—25 per cent.—than during the third month—11 per cent.—and during the fourth month—12 per cent.—after double ovariotomy. (2) that abortion follows with greater frequency after double ovariotomy—25 per cent.—than after a unilateral one—16·5 per cent.—during the first two months. They ask is it the ablation of the corpus luteum or do other causes account for these differences in the frequencies of these abortions? They reserve their decisions on this point but believe that the matter has a practical outcome in that the gynæcologist confronted with an ovarian tumour complicating pregnancy in the early months, should delay operative treatment of the tumour until the third or even the fourth month, as at this period abortion is least frequently seen after a uni- or bi-lateral ovariotomy. L.G.

The heart and pregnancy.

Fellner (*Monatssch. für Geburts. und Gynækol.*, 1913, Ht. 5). This is an analysis of 242 cases occurring in 42,000 deliveries in the Schauta Klinik, Vienna. Eighty-six were compensated and 156 uncompensated. The mortality was 6.

As a result of post mortem findings Fellner considers the increased size of the heart during pregnancy is due to dilatation and not to hypertrophy.

The blood-pressure is somewhat increased at the end of pregnancy. This is difficult to explain and is probably due to the placenta or suprarenals.

Towards the end of pregnancy many cardiac cases and also those with normal hearts suffer from dyspnœa, insomnia and slight œdema. There is however another group with tachycardia, sweating, nervousness, diarrhœa and occasionally exophthalmos, which is due to hyper-thyroidism accentuated by pregnancy and not to the heart itself. It is distinguished from true Graves' disease by the fact that the symptoms rapidly disappear after delivery.

There were only four cases of fatty heart but three of them were fatal.

Hydro-thorax and hydro-pericardium are the worst complications of heart failure.

Goitre occurred in ten cases and is very dangerous. Kypho-scoliosis and recurrent endocarditis each were noticed in five cases. Post partum hæmorrhage was very common.

The results to the children were very bad—113 deaths. The highest mortality (50 per cent.) was associated with double mitral lesions, and was in part due to the early induction of labour adopted as treatment.

Puerperal bradycardia is due to the recumbent position in bed with diminished oxygen requirements and to the lessened amount of blood circulating in the heart which is still dilated. It is not due to vagal stimulation, which is always associated with a low blood-pressure.

Cardiac disease is one of the causes of menorrhagia. In 150 cases of mitral insufficiency 30 per cent. had a history of menorrhagia and cases of the other lesions gave similiar histories.

Fellner concludes that cardiac lesions themselves are not necesarily dangerous, the condition of the cardiac musculature is more important. Those hearts, which have been bad during pregnancy, do not always fail during delivery. The worst cases are often those which have had only slight symptoms during pregnancy.

In compensated cases abortion should be induced if the patient has been in danger at a previous delivery. In uncompensated cases this should be done if medical treatment fails or if there are other complications such as tuberculosis, goitre, chronic nephritis. It is better not to adopt these measures in cases of recurrent endocarditis, hydro-thorax and—pericardium. For the latter two nothing should be done or at the most puncture and aspiration of some of the fluid. Accouchement forcé should be avoided, especially in cases near term. The rapid emptying of the uterus caused severe collapse in many of the cases.

After delivery, the question of sterilisation must be considered, and it should be performed in the majority of cases. R.M.A.

The relation of urea to pernicious vomiting of pregnancy.

Dervaux (*Bulletin de la Société d'Obstétrique et de Gynécologie de Paris, etc.*, No. 4, April 1913) contributes an important article upon nitrogen metabolism and the urea output in cases of pernicious vomiting of pregnancy. In a case of typical toxæmic vomiting he estimated the urea content both in the urine and blood. At the first investigation the urine yielded 18.21 grammes per litre and the blood 1.26 per litre. Twelve days later the urine contained 10.24 grammes of urea per litre and the blood 1.07, giving a formula of .3. The writer is of opinion that much valuable information, both of a prognostic and therapeutic importance, may be obtained by a systematic study of the nitrogen metabolism. The simple estimation of urea output alone is liable to give a fallacious impression. It must be considered in relation with the nitrogen intake, the loss of weight and the concentration of nitrogen in the blood, in other words, the degree of "azotemia" present.

Dervaux observes that although the urea output may be considerably lowered, when considered in relation with the total maternal nitrogenous metabolism, this lowering appears to be more apparent than real.

Nitrogenous destruction, as estimated by the weight curve, absorption of nitrogen, and urea output, appears to be considerable in toxæmic vomiting and its degree is in direct ratio with the serious condition of the patient. Furthermore, the ratio between the urea content in blood and urine seems to show a lowering of the coefficient of maximum concentration of this substance and consequently a deficient function on the part of the kidney, which cannot be ascertained by examination for albumen alone. In the writer's case the degree of "azotemia" was considerable and in accordance with the serious condition of the patient.

Dervaux suggests that further observations should be made with a view to establishing the nitrogen balance in toxæmic vomiting, and to ascertain what variations exist in the coefficient of maximum concentration, and the degree of "azotemia." If these observations and suggestions are confirmed it is possible that information may be obtained which will be of consider able value in the diagnosis, prognosis, and indication for operation.

H.B.W.

Fatal chorea in pregnancy.

Lepage (*Bulletin de la Société d'Obstétrique et de Gynécologie de Paris, etc.*, No. 4, April 1913) describes a fatal case of chorea gravidarum in a ii-para, and in an important article discusses the etiology and prognosis

of this condition with references to the literature, and 33 fatal cases collected from the same.

In the case of twenty patients who died during pregnancy without any surgical intervention, eleven were primiparæ, five were in their second pregnancy, and two in their fourth. Five women aborted before the fatal termination and in three premature labour occurred within the two last months of pregnancy. Autopsy revealed very little of interest. In three cases endocarditis was found. In many instances retention of urine is noted, with or without incontinence. The writer attaches considerable importance to this symptom from the point of view of prognosis. It usually heralds a fatal termination.

In the case of thirteen women who died after the pregnancy had been terminated, seven were primiparæ, three in their second pregnancy, one in the third, and one in the fourth. In four cases the uterus was evacuated near to term, but in the others during the first six months, and usually about the third or fourth month. In three of these patients endocarditis was noted at the autopsy. Lepage observes that many facts point to the probable toxæmic origin of the condition. The usual appearance of the choreic symptoms about the third month, the mental symptoms, and tachycardia are all of this nature.

The writer concludes that although many cases occur in which the patient recovers, it must not be forgotten that a fatal result sometimes occurs very rapidly after severe choreic symptoms. The principal symptoms which herald such a termination are the following: (*a*) Marked increase in the severity of the choreic movements which not only hinder absorption of nutriment but also prevent sleep, and are uncontrolled by any medicinal measures. (*b*) Mental troubles, which may precede the chorea but which more often accompany it. (*c*) Acceleration of pulse, and rise of temperature. (*d*) Appearance of a morbiliform eruption. It does not appear that the termination of pregnancy influences the prognosis although for a few hours following the evacuation of the uterus the symptoms improve. As a rule, however, the choreic movements soon reappear and in a more intense form than before. Apart from the lesions of endocarditis, autopsy usually reveals little of importance.

In the present light of knowledge Lepage does not think that it is possible to determine the part which toxæmia plays in the production of the choreic movements. Nor do we know the reason why chorea is particularly dangerous in the case of some pregnant women and not in others. H.B.W.

REPORTS OF SOCIETIES.

ROYAL SOCIETY OF MEDICINE.

Section of Obstetrics and Gynæcology.

Meeting held Thursday, July 3, 1913.

The President, Dr. Amand Routh, in the Chair.

A short communication on a

Calcified Fibroma of the Ovary Obstructing Labour

was read by Dr. H. S. Souttar, and the case was discussed by Dr. Herbert Spencer, Dr. Drummond Maxwell, and Dr. Hubert Roberts.

Mr. Charles P. Childe (Portsmouth) read a paper on

Suggestions for the Technique and Performance of Wertheim's Abdominal Hysterectomy.

The author pointed out that the two conspicuous risks of the operation were shock and sepsis. Certain conditions specially favourable to the occurrence of infection should be recognised—(*a*) diminished resistance due to bad general health; (*b*) a certain amount of injury to the tissues of the abdominal wall due to retraction required during the operation; (*c*) the presence of a pelvic wound open to the external surface through the vagina; (*d*) the space of Retzius freely opened, offering favourable position for the accumulation of fluids. In some cases general infection from an ulcerating malignant growth is present at the time of operation. Great care should be taken to avoid fouling of the wound surfaces when the vagina is divided. The author's practice was to remove all the soft parts of the growth with scissors and sharp spoon at the first stage of the operation. The raw surface was then freely cauterised, and the vagina carefully dried and painted with 2 per cent. iodine in spirit. Finally the vagina was closely packed with dry sterile gauze, the end of which was left hanging out of the vulva, to be withdrawn when the vagina was divided later on. Another important point was the manner of dealing with the pelvic wound. The author had entirely given up drainage with gauze as recommended by Wertheim, and he now never employed gauze except for hæmostasis. He laid great stress on securing complete hæmostasis, and on leaving as few ligatures as possible in the pelvic wound.

In the easiest cases the operation was severe and prolonged, and shock could best be controlled by shortening the operative procedures as much as possible. The longest part of the operation was dealing with the parametrium and the divided edges of the vagina. The author now employs only four ligatures (silk), one for each ovarian and one for each uterine artery. The round ligaments and parametria are crushed with strong forceps and the tissues divided with Paquelin's cautery. Bleeding from the vaginal walls could be avoided by applying a modified Wertheim's forceps to the part to be divided for a moment beforehand. In this way a dry pelvic wound could be secured, and the cautery would destroy cancer

cells in the seared tissues. Finally, the peritoneum is sewn over without drainage, and the abdominal wound closed in layers. A ligature or two may be required when separating the bladder. A special crushing forceps designed by the author was shown.

The paper was discussed by Dr. Herbert Spencer, Mr. Douglas Drew, Dr. Russell Andrews, Dr. Vaughan Sawyer, Dr. Cuthbert Lockyer, and Dr. H. Taylor Young (Sydney, N.S.W.).

The PRESIDENT then delivered his valedictory address entitled "Observations on the Toxæmia of Pregnancy and on Eugenics from the Obstetrical Standpoint."

Votes of thanks were passed to the retiring President, to the retiring Vice-President, to the Chairman of the Pathology Committee, to the retiring Hon. Librarian, and the retiring Hon. Secretary, and the Section closed for the Session.

EDINBURGH OBSTETRICAL SOCIETY.

A Meeting of this Society was held on Wednesday, July 9, Dr. HAIG FERGUSON (President) in the Chair.

Dr. BREWIS first showed a series of cases of interest :—

(*a*) Fœtus with cord and placenta, advanced to fifth month, from a case of secondary abdominal pregnancy, removed through the vaginal roof.

(*b*) Pregnant uterus removed by complete hysterectomy for cancer of the cervix.

(*c*) Pregnant uterus, complicated with large degenerating fibroid tumour, removed by supra-vaginal hysterectomy.

(*d*) Uterus showing adeno-carcinoma of the body, complicated with pyometra and pyosalpinx, removed by total hysterectomy.

(*e*) Uterus showing adeno-carcinoma of the body, secondary to submucous fibromyomata.

(*f*) Two examples of tubal mole.

Dr. MCGIBBON read a paper on

FATAL CASES OF JAUNDICE IN THE NEW-BORN CHILD WITH NOTES OF A CASE IN SUCCESSIVE PREGNANCIES.

The more usual forms of icterus neonatorum were referred to, but the paper specially dealt with a form of jaundice which is generally fatal and which is associated with somewhat extraordinary changes in the blood, the essential features of which are the great reduction in the number of red cells and the presence of large numbers of normoblasts and megaloblasts. The disease has been described under various names, such as hereditary icterus and congenital familial jaundice. The majority of cases die within a week, some live a few weeks, and occasionally an infant whose blood has shown all the characteristics of this disease, recovers completely. Many infants who died with jaundice before modern methods of blood examination came into vogue, were probably true examples of the disease.

Isolated cases have been reported, but the majority have been members of the same families. Such have been described by Audin, Arkwright, Ashby and Wright, Busfield, and others.

Dr. McGibbon then gave short details of a series of cases which had come under his own observation. The mother had had six pregnancies, all of which went to full term except one, which terminated at the eighth month.

The 1st pregnancy : a male child, born September 1902, with no jaundice and never showing any trace of such, now a healthy strong boy of 10 years.

The 2nd pregnancy : a male child, born October 1904, with jaundice, but recovered and is now a strong, healthy, well-developed boy of 8 years. At birth the entire body had a pale lemon tint, which deepened next day. Spleen was much enlarged. A blood count and blood films showed the features characteristic of the disease.

The 3rd pregnancy : a female child, born April 1906, at full term and well developed, jaundice well marked at birth, becoming rapidly profound. Spleen enlarged. Urine bile-stained. Fell into a very drowsy condition and died on the fifth day. The blood showed similar characters.

The 4th pregnancy : a female child, born July 1907, at full term and well nourished. Jaundice at birth slight but distinct. Spleen enlarged. Umbilical hæmorrhage set in and child died on the seventh day. Blood changes as previously.

The 5th pregnancy : a female child, stillborn in December 1909, at the eighth month. Jaundice well marked over the entire body.

The 6th pregnancy : the last which this woman has had, delivery taking place in January 1913. Child jaundiced, spleen large. Died suddenly on the third day. An umbilical hæmorrhage upon this occasion.

The main changes in the morbid anatomy were as follows : Small hæmorrhages under the peritoneum and in the lungs. The liver showed great increase in the size of the islands where blood-formation was in progress. In two of the cases there was an increase of connective tissue, and in one there was distinct blockage of the common bile-duct at its entrance into the duodenum. The thymus and lymphatic glands showed a marked increase of fibrous tissue, and Drs. Buchan and Comrie found an entire absence of colloid material. The kidneys showed some cloudy swelling only. Suprarenals were enlarged and exhibited cloudy swelling.

The pathology is obscure. Various views have been suggested. The toxic theory is difficult to accept because one would expect to find more pronounced changes in the kidneys. In the series of pregnancies which came under the writer's observation the mother was entirely free from any symptoms suggestive of anything toxic. So far also as this series is concerned there is not the slightest evidence of syphilitic taint, nor is there anything in the obstetric history suggestive of syphilis. A recent Wassermann test of the mother's blood brought out the report of " slightly positive."

The most recent view appears to be that this type of jaundice is due to some undue fragility of the red cells, whereby they become broken up by slight causes. The diagnosis should always be made from an examination of the blood.

Dr. McGibbon summed up the following points in "Congenital Familial Jaundice" :—

(1) It tends to affect several members of one family.

(2) Its essential features are jaundice visible at birth or becoming visible within 24 hours, an enlarged spleen and profound anæmia.

(3) Syphilis as an etiological factor cannot be excluded as yet, but there is no evident connection.

Dr. HAULTAIN delivered a communication upon

THE USE OF VERATRONE IN THE TREATMENT OF ECLAMPSIA.

During a large experience of eclampsia among its varied manifestations Dr. Haultain had observed that one alone seemed to be present in every instance, viz., much increased blood-pressure. This was usually, though not invariably, associated with increase of pulse-rate. This high vascular tension, whatever its cause, had much to do with the actual convulsive seizures, and much of the treatment recommended had been on the lines of its reduction. To this blood letting, thyroid extract and the nitrites probably owed the little success they had been shown to exercise. For many years veratrum viride had been used with considerable benefit and had been considered a specific among some of the older authors. He himself had always been favourably disposed to it and had used it frequently where opportunity offered with success. Formerly, unfortunately the only valid preparation had been the tincture which was impossible to administer to a comatose patient, while hypodermic preparations had caused severe local reaction.

Recently, however, Parke, Davis and Co. introduced a hypodermic preparation of the essential alkaloids contained, viz., veratroidine and jervim, under the name of veratrone, and this had been used in the cases to be described. Veratrone was essentially a vascular depressant, though also said to be a spinal sedative, a combined action which seemed ideal for the treatment of eclamptic seizures. It was made up in 1 c.c. sterilized ampoules and on injection intra-muscularly gave rise to no local untoward effects, but had its marked general effects as noted in the following cases:

1. Primipara, had shortly after delivery two severe fits. Urine very scanty and solid on boiling. B.P. 160, pulse 106. Injection of 1 c.c. veratrone. In 30 minutes B.P. 120, P. 75; in 70 minutes B.P. 105, P. 50. No further fits. Recovery. The only other treatment was a hot pack.

2. Primipara, developed fits shortly after delivery. Morph. sulph., gr. ½, was given immediately and stomach washed out, but fits continued. Morphia was repeated until 2 grains had been given hypodermically, but fits continued. There had been 11 fits when Dr. Haultain first saw the case. B.P. 160, P. 94. Urine solid. 1 c.c. veratrone was given. In 40 minutes B.P. 104, P. 60. Patient had no further fits, but did not recover consciousness for 36 hours, probably due to morphine poisoning, after which she made an uninterrupted recovery.

3. v-para, with history of hystero-epilepsy. At 9 a.m., February 28, had a convulsion for which she was given morphia, gr. ½. Within the next three hours four more fits occurred. Urine scanty and solid on boiling. When first seen at 12-30, B.P. 160, P. 85. Os slightly dilated. 1 c.c. veratrone now given. Within an hour B.P. 105, P. 72. Child born without further fits at 5.20. Immediately after delivery, however, she had another fit. B.P. 150, P. 80. 1 c.c. veratrone given again. No further fits, but she became maniacal and had to be sent to the asylum.

4. iii-para. Previous confinements difficult. Had suffered from kidney disease with œdema for over a year. Eight months' pregnant. Had in the course of eight hours about ten fits. Urine scanty, highly albuminous, and containing blood. B.P. 150, P. 85, T. 98.6. 1 c.c veratrone given. In half-an-hour B.P. 100, P. 63, still comatose. Three hours later her B.P. went up to 120 and P. 120, T. 100.6. 1 c.c. veratrone again given and in 20 minutes B.P. 108, P. 88. From this time onwards pulse and temperature

gradually rose till seven hours later, just before death, P. 160, T. 108 were recorded. Half-an-hour after death temperature in axilla was 109 F.

5. Primipara. Shortly after labour had first fit, after which she had eight within the next four hours. B.P. 170, P. 108. Urine solid on boiling. 1 c.c. veratrone given after which only one fit occurred, and in 40 minutes B.P. 105, P. 56. Complete recovery.

6. ii-para, six months pregnant. Six fits. Urine very scanty and solid. Last fit at 3-35 p. m.

3-40.....	B.P. 160	Pulse 104	1 c.c. veratrone given.
3-45.....	B.P. 145	Pulse 104	—
3-50.....	B.P. 140	Pulse 108	—
4 p.m.	B.P. 125	Pulse 84	—
4-10.....	B.P. 110	Pulse 68	—
6-35 fit	B.P. 150	Pulse 88	—
6-50 fit	—	—	—
7-30 fit	B.P. 160	Pulse 94	1 c.c. veratrone given.
8 p.m.	B.P. 110	Pulse 60	—

Complete recovery and in four days no albumen in the urine. Since that time she has remained well, is taking milk and farinaceous diet. The pregnancy is progressing favourably. No trace of albumen is present and her confinement is now daily expected.

7. Primipara. During labour had two fits. B.P. 165, P. 110. 1 c.c. veratrone given. In 45 minutes B.P. 110, P. 65. Three hours after labour a severe fit. B.P. 160, P. 80. 1 c.c. veratrone given. In 30 minutes B.P. 105, P. 54. No further fits. Complete recovery.

In perusing the foregoing account Dr. Haultain said one could not but be impressed by the rapid and marked diminution in the blood-pressure and pulse-rate after the use of veratrone, and the consistency with which fits were inhibited while the vascular tension was low. The pulse-rate and blood-pressure seemed to vary with one another and it was thought that veratrum viride was not dangerous unless given to produce a pulse-rate below 50. It was thought advisable to bring the pulse-rate down to 60. The action seemed evanescent and cases had to be watched in case a repeated dose were necessary, as seen in cases 3, 6, and 7. In case 6 it was interesting to note how the effects of the poison could be successfully combated and pregnancy be allowed to continue a normal course. Dr. Haultain had had seven such cases in his experience, but none so early as the sixth month.

The object in practice has been to diminish the blood-pressure and the use of morphia has been entirely given up.

Beyond the hot pack to induce sweating and the washing out of the stomach leaving therein at the same time 4 to 6 ozs. of salts, no other form of treatment was used.

Dr. E. Scott Carmichael then described

Two Cases of Tumours Complicating Pregnancy.

1. Cæsarean section for fibromyoma in twin pregnancy. The comparative rarity of Cæsarean section for fibromyomata as a complication warranted the record of the case. Pinard, Spener, Donald, and others had shown how common such tumours were in pregnancy and how rarely surgical interference was required. The present case required laparotomy at the fifth month and again at full term. A primipara, æt. 42, on the 25th October, 1911, complained of severe abdominal pain at the fifth month.

She had been married six years without pregnancy supervening, and she was anxious to have a child. During the previous two months attacks of pain had been periodic. On abdominal examination the pregnant uterus, corresponding in size to that of a five months' pregnancy, was felt, with in addition a small intensely tender tumour, the size of an apple, situated to the left and below the umbilicus and attached to the uterine fundus. It was freely mobile, having evidently a small narrow pedicle. A second tumour could be felt in the hypogastrium on the antero-lateral wall of the lower uterine segment, passing downwards and encroaching upon the cervix as felt *per vaginam*. The first tumour was successfully removed; and on account of the close proximity to the cervix and pelvic brim it was considered that the second tumour would interrupt labour *per vias naturales*. Accordingly the patient's last menstrual period having occurred on May 22, 1911, pregnancy was allowed to go on till February 2, 1912, when she was again submitted to operative interference. Cæsarean section revealed two fœtuses. Uterus contracted well after removal of the placentæ. Considering the age of the patient and the position of the remaining fibroid, supravaginal hysterectomy was performed. An uninterrupted recovery was made and both children were doing well.

2. In the second case the abdomen was opened at the sixth month of pregnancy, because of symptoms of intestinal obstruction. For two days there had been severe spasmodic abdominal pain and gradually increasing distension. There had been a similar attack one month previously. On examination of the abdomen there was marked distension with tympanitis all over and considerable tenderness towards the left lumbar and iliac regions. There had been no passage of flatus for 24 hours. There had been a feeling of sickness but vomiting only once. Rectal examination revealed nothing. Obstruction of the colon low down was diagnosed, probably volvulus of the pelvic colon. A high enema was given without benefit. After the abdomen was opened, greatly distended large bowel of a dark purple colour presented, resembling the bowel in a strangulated hernia on the point of gangrene. The intestine on being punctured with a trochar and canula collapsed. It proved to be a loop of pelvic colon, which was encircled at its base by the long pedicle of an ovarian cyst, which was twisted on itself one and a half times. Pedicle and cyst were removed and, as the bowel was already beginning to regain its normal appearance, nothing further was done. Recovery was complete, but on the sixth day profuse hæmorrhage from the vagina set in. A marginal placenta prævia was recognised. The fœtus was turned and delivered. It lived only eight hours.

Dr. Murray Drennan showed

A Specimen of Chronic Parametritis with Double Hydronephrosis.

The mass of inflammatory tissue extended from the uterus on both sides. In its shrinkage it had involved the lower ends of the ureters. This had given rise to the hydronephrosis.

REVIEWS OF RECENT BOOKS.

"The Difficulties and Emergencies of Obstetric Practice." By COMYNS BERKELEY and VICTOR BONNEY. J. and A. Churchill. 287 original illustrations. 24/- net.

THIS work constitutes yet another effort to deal with the practical problems of obstetrics apart from the theory.

It starts from a point where a good nursing manual should end and covers the entire ground connected with abnormal midwifery.

The opening chapter is excellent, dealing as it does with the diagnosis of pregnancy. Fig. 1 clearly illustrates the novel position preferred for bi-manual examination, in which the patient's trunk is corkscrewed. The authors set out its advantages in detail. These do not seem very convincing to us, but not having given the position a practical trial we do not care to criticize it adversely.

It will surprise many to hear that "Hegar's sign" is of "but little practical value in a case of difficult diagnosis, but in some cases when combined with other symptoms, it affords presumptive evidence of real value."

The succeeding thirteen chapters are mainly concerned with ailments found in association with the pregnant state.

This section is almost encyclopædic in the number of diseases considered. Splenic anæmia, retro-bulbar (spelt buller) neuritis, parturitional paralysis, and anchylostomiasis are a few conditions we select for note amongst the formidable list.

Complications of labour are discussed in the ten succeeding chapters.

They deal with different varieties of hæmorrhages, mal-presentations, deformed pelves, ruptured uterus, and will not fail to interest and instruct.

It would seem as difficult to select the most efficient method in the practice of obstetrics, as it is to name the best motor-car. Possibly there may be nothing in either category which conforms to the descriptions "most efficient" or "best." As cars differ in their adaptability to the individual, so may it be in respect to different operative procedures. We must not then be taken to disparage this work in any way, because we cannot in many practical points see eye to eye with the authors.

We find the usual effort made to distinguish between threatened and inevitable miscarriage. The distinction has always appeared to us an impossible one as every inevitable miscarriage begins with the symptoms usually associated with that of threatened, and when the one condition ends and the other starts no man can say. Its retention as a guide to practice is apt to mislead rather than to help, and it has been in the past a fruitful occasion of dangerously meddlesome interference on the part of the highly strung attendant.

We are pleased to see that the authors clearly discern the dangers of premature interference, even though the miscarriage be inevitable, and append the following warning. "The practitioner having arrived at the conclusion that miscarriage must take place, should treat the case like an ordinary labour, only interfering if,

1. The ovum felt presenting in the cervical canal is delayed there.
2. The bleeding is serious.
3. Sepsis intervenes.
4. The miscarriage is incomplete."

It is advised to clear out the uterus as follows, "The patient being on her back . . . the operator with his left hand presses down the uterus through the abdominal wall so as to bring it within reach of his right index finger which he has meanwhile inserted into the vagina." "The index finger of the right hand can now, as a rule, be passed through the cervical canal behind the ovum, and up to the fundus, and the ovum is separated and extracted by the finger."

Save in cases of partial prolapse we have never seen any one able to accomplish this feat, and under ordinary conditions it requires that at least four fingers be passed into the vagina, before one of them can reach the fundus.

A key to the solution of this difference of opinion is possibly furnished by a close perusal of some of the very excellent illustrations which are beautifully executed, and constitute not the least important section of the work. Many of these are remarkable for the length of finger portrayed and the obstetrician should indeed consider himself fortunate were he possessed of the anatomical advantages shown in fig. 195.

When dealing with the treatment of accidental hæmorrhage the vaginal plug is advocated, and its application receives a careful description from the authors who state that if it is "To be efficacious, vaginal plugging must be carried out very thoroughly." The usually accepted explanation of its mode of action is given, namely, that it stimulates contractions of the uterus and by increasing intra-uterine pressure stays further flow from the sinuses. These explanations do not satisfy the authors for they are obviously insufficient to explain the rapid cessation of bleeding after the plug's application. They are therefore by force of logic driven to the lame conclusion that the stoppage of hæmorrhage is a coincidence. They write: "We think there can be no doubt that in some of these cases the bleeding has stopped by the time the practitioner comes on the scene, and that in such, plugging the vagina has the great advantage of compelling him to pursue a course of masterly inactivity." There seems little escape from this position for those who disbelieve in the power of the tampon to exert direct pressure on the great uterine vessels which pass up at either side of the uterus. These lie close to its vaginal connection, and when it is remembered that a properly placed tampon can be palpated high above Poupart's ligament, it is not difficult to understand how the uterus can be pressed down, so that its side walls will be opposed to the plug. Surely we have here a more reasonable explanation of the phenomenon than that which depends upon coincidence.

Labour complicated by mal-presentations is dealt with very fully whilst the illustrations are numerous and instructive. We note that the soft fillet is damned by faint praise. It "is at times difficult to pass and when it is passed is rarely effective. As, however, it is at times successful, it is worth trying before using the blunt hook."

Following this the application of the blunt hook is fully described and illustrated. There is little doubt therefore that the latter plan will receive greater consideration than the former from those who are influenced by these writings, nor will their relative merits be affected by the warning. "We think it is always well therefore to try a soft fillet first if the child

is alive, in spite of the fact that it is not a particularly satisfactory means of delivery."

Other illustrations show, amputation of thigh for impacted breech, cephalotribe, and cranioclast application for similar conditions, and a crotchet dug into the abdominal wall above the pubes. It is possibly assumed that the child will have died before these diverse procedures are adopted, but in impacted breech death is by no means inevitable, and we should have liked to read an emphatic condemnation of all murderous procedures in the presence of a living child. With pubiotomy as an alternative, it is inconceivable how any obstetrician could hesitate between the two, particularly when it is known that destructive operations are attended with a high maternal mortality.

The treatments recommended for locked twins are briefly given, but fail in not being sufficiently explicit, particularly in respect to the difficulties likely to be met with. The reasons which determine the adoption of any of the suggested destructive operations also might have been stated with advantage. In their absence one wonders whether pubiotomy would not furnish a more humane means of overcoming this special complication.

Champetier de Ribe's bags are favoured as the most suitable treatment for unavoidable hæmorrhage. On page 704 a series of disadvantages accruing to the bags is given, and the list though long could easily be added to.

Their superiority over other methods ought to be made clearly apparent, and we regret the omission of figures in proof of this claim. Many years ago such figures were published, but even at the time they appeared to us very unconvincing. Since the introduction of rubber gloves, the results of bi-polar version have much improved.

We do not know from what source the authors obtained their statistics when they name 8 per cent. as the present-day maternal mortality of placenta prævia. The statistics of the Rotunda Hospital during the years 1903 to 1910 inclusive show a mortality of 5.3 per cent. in 113 cases treated. Of these, 41 were delivered in the hospital proper with but one death. As far as our recollections serve, no better results than these have been published by those who favour treatment by the hydrostatic bag. It is claimed no doubt that fœtal mortality is improved by the latter, but here again a grave doubt exists, for the factors which influence infantile mortality fall mainly under two heads, and are quite independent of either one or the other method. These are,

1. The period of gestation.

2. The time when treatment is begun. With the early control of hæmorrhage and the presence of a viable fœtus the chances of its survival after being turned are quite good, and no more than this can be said for treatment by the hydrostatic bag.

We are warned against compression of the aorta as a treatment for post partum hæmorrhage. It is termed "A singularly unscientific proceeding." Yet as an emergency measure it has proved its usefulness, and has in all probability been the means of saving many lives. When it is remembered that the manœuvre is not attended by any possible dangers, it is hard to believe that those condemning it have ever put it to a practical test.

Again, we read "The practice of treating post partum hæmorrhage from the uterus by hot douching, ergot and compression, but without exploring the uterus, is a very bad one, because, although it may succeed

in stopping the bleeding more or less, clot is left retained in the uterine cavity."

Can any evidence be produced to show that it is more dangerous to leave blood clot in the uterus, than to remove the clot by manual exploration? Such exploration when conducted amongst the most favourable surroundings is a procedure which cannot be undertaken with impunity. It is attended with an increased morbidity rate in the modern maternity hospitals, and it is reasonable to believe that a worse showing must result, were it to become an accepted treatment in every-day practice.

Vaginal douching is advised as a routine during the puerperium provided a trained nurse is in attendance, and several theoretical reasons are given to prove its advantages.

It is "recommended on the score of ordinary cleanliness, by which it appeals to all refined women," and is thought "peculiarly reasonable in view of the length of time that the puerperal woman remains recumbent, a position in which the free drainage from the vagina is interfered with." The first portion of this reasoning could with equal force be made to apply to lavage of the nose, the ears, and the rectum, and the latter can only be sustained in the presence of more favourable statistical results.

We have never seen any figures which warrant such assumption, and the undoubted fact remains, that morbidity is lowest in the hospitals which do not adopt the practice.

The following statement is very loose and can only be considered an unfortunate exaggeration. "Although death or severe illness from puerperal sepsis are almost unknown in well organised lying-in hospitals, yet these disasters are still not infrequently met with after home-conducted labours."

We have seen no annual clinical Report which justifies this statement, and we must reluctantly admit, that serious septic illness—sometimes leading to death—is still invariably recorded in all those Reports which we have studied.

The manner of guarding against sepsis is admirably epitomised as follows:—

"1. To ensure sterility of . . . hands and appliances.

2. To sterilise as far as may be possible, the lower part of the genital tract.

3. To avoid as far as may be possible, the transference of organisms from the lower, to the upper part of the genital tract.

4. To re-sterilise the genital tract, as far as may be possible, whenever such transference may reasonably be supposed to have occurred.

5. To leave the uterus empty and well retracted, and to promote free drainage from the vagina afterwards.

6. To prevent the bruising, and laceration of the soft parts due to prolonged pressure during labour."

Following this occurs an emphatic recommendation that gloves be worn not only in attendance on labour, but also in all manipulations which are likely to be associated with the risk of septic contamination.

The chapters dealing with Cæsarean sections and the pelvic enlargement operations, are clear, well illustrated, and very instructive, whilst the last 48 pages are devoted to the infant, its diseases, and its management.

In conclusion we can confidently recommend this work as one which contains much information of the greatest value.

Where we have differed with the methods recommended, we are perfectly aware that we tread on controversial ground, and think it probable that our views will not be shared by the majority of readers. E.H.T.

"The Principles and Practice of Obstetrics." By Professor De Lee, Professor of Obstetrics to the North-western Medical School. Philadelphia and London: W. B. Saunders Co. Pp. 1060. Large octavo. Price 36/-.

In this latest American text-book Professor De Lee has set a very high standard both in the theoretical and practical aspects of the obstetric art, and its pages reflect the conclusions drawn from many years' experience as an obstetrician and a teacher.

The book is written for students and practitioners; and, bearing in mind the crowded condition of the modern medical student's curriculum on the one hand, and the practical requirements of the practitioner on the other, the author has attempted to supply the wants of each class by making use of two sizes of type. General principles and the broad lines of treatment have been printed in large type, while theoretical discussions, details of treatment, technique, etc., have been set out in slightly smaller print. This is a good method of dealing with an undoubted difficulty, but we think, nevertheless, that the average student will consider that the book covers too much ground for his purposes. There can be no question however that those who are engaged in teaching midwifery will find the book invaluable not only from the able discussions of difficult problems, but also from the excellence of the illustrations with which its pages are replete. The practitioner also, who is an obstetrician rather than a mere midwife, will obtain from its study an amount of interest and instruction which will well repay him for his trouble. He will realise that, as the author says in his introduction, "not the majority but the minority of labours are normal, and not until the pathologic dignity of obstetrics is fully recognised may we hope for any considerable reduction in the mortality and morbidity of childbirth."

The subject matter of the work is divided into four parts: (1) The physiology, (2) The conduct, (3) The pathology of pregnancy, labour, and the puerperium respectively. The final section deals with operative obstetrics.

Fertilisation and development are clearly and concisely described, and here, as in other parts of the book, all sides on controversial or unsettled points are fairly put forward. Professor De Lee does not appear to accept the estimate of Teacher and Bryce as to the age of Peter's ovum which he refers to as "not over eight days," but he does not enter into any discussion on the subject.

The anatomy and mechanism of the three stages of labour are described and illustrated in a manner which leave nothing to be desired. It is, perhaps, a matter of opinion as to whether the Latin terms and abbreviations are to be preferred to the English equivalents for the different presentations. The author himself has no doubt about the matter, but he has rather a habit of changing nomenclature, as for instance: "abruptio placentæ" for accidental hæmorrhage and "anærosis" for asphyxia. The reasons supplied for these and other changes of terminology are not

always convincing. The details of the aseptic conduct of labour are very fully described, and the necessity for the use of sterilized gowns, cloths, and rubber gloves is insisted upon. But after the emphasis which Professor De Lee lays upon the adjuncts to the proper technique of labour, it is a pity that he should publish a series of eight photographs taken at the Chicago Lying-in Hospital showing an attendant delivering a patient without even rubber gloves!

The section dealing with hyperemesis gravidarum is a little disappointing. The reasoning here does not seem to be as close or as critical as in other parts of the book. For instance, the author is a firm believer in the reflex theory of vomiting in pregnancy, and in support of his view he quotes a case in which vomiting stopped when anteflexion was cured by means of an inflated bag placed in the vagina. The bag leaked through a pin-hole and the vomiting recurred but was permanently "cured" by the insertion of a perfect bag. The writer admits that this type of vomiting often stops spontaneously, and it is at least possible that his case is an example of this well-known peculiarity. The claim for erosion of the cervix as an ætiological factor in vomiting in pregnancy is somewhat discredited when we find that the author advises that, in treating these cases, the cervix should be painted with silver nitrate "whether it is eroded or not." In view of the strongly expressed views of many writers of note that the "reflex" type of vomiting does not exist, we feel that some rather more cogent arguments should have been submitted. The reader may be surprised to find that while meat is excluded from the diet of patients suffering from hyperemesis gravidarum, strong beef-tea is advised. Is this on the grounds that it is the *animal protein* and not the *extractives* which are harmful? The author rightly insists that the induction of labour must not be delayed until the patient is exhausted, but he does not indicate what he believes to be the relative importance of such indications as blood changes, increase in the pulse-rate, loss of weight, acetonuria and indicanuria.

In discussing eclampsia, on the other hand, the writer gives a lucid and critical account of the various theories, and supplies most practical and concise details for treatment. In general terms Professor De Lee's advice is to empty the uterus as quickly as possible by manual dilatation when the cervical canal is obliterated, but otherwise by vaginal or abdominal Cæsarean section. Narcotics are to be avoided, and if an anæsthetic is required ether is to be used. There is a small error in this chapter: Williams does not, as here stated, support the view of Edgar and Davis that eclampsia is an entirely preventable disease.

The article on ectopic pregnancy is beautifully illustrated and contains some useful tables on differential diagnosis. In speaking of ovarian pregnancy the author says that "over thirty cases" have been recorded, but a very cursory glance through the literature would have shown him that fully half as many again have been reported since 1906 when Williams collected these thirty cases.

The author's experience in accidental hæmorrhage—or "abruptio placentæ," as he prefers to call it, must be almost unique. He gives a most graphic and vivid account of *concealed* accidental hæmorrhage together with its differential diagnosis from placenta prævia and uterine rupture. But he does not point out, as is we believe the experience of most obstetricians, that this condition is the exception and not the rule. This omission will leave the student with quite a false impression on the whole

subject of accidental hæmorrhage. Cæsarean section is somewhat tentatively recommended for this dangerous condition. The same treatment is also (but more strongly) advocated in placenta prævia when the mother and child are in good condition and the cervix is closed and rigid.

The description and general rules for treatment in contracted pelvis follow the lines laid down by most modern authors. Induction of labour is not recommended on account of its high fœtal mortality, and pubiotomy has "but a very limited field of usefulness."

The important subject of injuries to the pelvic floor is minutely dealt with, and the very numerous illustrations greatly enhance the value of this section.

It is only recently that attention has been called to the dangers of replacing an inverted uterus while the patient is suffering from profound shock, and, contrary to the teaching of almost all text-books, Professor De Lee insists that the condition of shock must be first treated and then the uterus replaced when the patient has recovered.

The sixty odd pages devoted to the discussion of puerperal infections form one of the most interesting, lucid, and practical essays which it has been our good fortune to read upon this important subject. After an extended trial of most methods of treatment the writer has come to the conclusion that the infected uterus is best left to itself provided that there is no hæmorrhage. In this event, the uterus is packed daily with gauze, and the author finds that in most cases the tissue comes away, but if not, active steps for its removal are only to be undertaken after the temperature has been normal for two weeks. The author speaks strongly upon the use of the curette in these cases, and he says that he hopes that the use of this instrument in simple puerperal infection will soon be regarded as a criminal procedure.

Although we may not see eye to eye with the author on all the points which he raises, there can be no doubt that the work forms a very notable addition to the existing literature on scientific obstetrics and we can strongly recommend it to the notice of all obstetricians, but more especially to those who are engaged in teaching.

The publishers are to be congratulated upon the general get-up and printing of the volume and upon the reproductions of photographs, colour drawings, etc., which show a very high grade of technical skill.

W.W.K.